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Encountering Limits: The University Museum

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Wu Tsai-yen, *Three Friends in Winter* (1953), Finger painting in Chinese ink and colours; 97 x 33.5 cm, gift of Malcolm MacDonald. NUS Museum S1955-0106-001-0

Wu Tsai Yen (1911–2001) was born in China’s Fujian province, on the cusp of the birth of Republican China. His artistic formation coincided with the zeitgeist of cultural modernization within China, and the artist had studied finger painting under Pan Tianshou at the modern Xinhua Academy of Fine Arts in Shanghai. Brightly coloured pigments, natural and botanical motifs remained a key feature of Wu’s finger-painted art throughout his life.

In 1938, Wu arrived in Singapore, where he was to settle for the rest of his life. Under the patronage of the magnate Loke Wan Tho, Wu rose to prominence in the local artistic circles. Through Loke, Wu became acquainted with Malcolm MacDonald, the British Commissioner-General for Southeast Asia based in Malaya (1948–1954), and made many gifts of his paintings to the Commissioner-General. When MacDonald left Malaya in 1955, he donated his personal collection of artworks acquired during his tenure to the University of Malaya Art Museum, based in Singapore.

The featured painting *Three Friends of Winter* (Pine, Bamboo and Plum Blossoms) is one of Wu’s paintings for MacDonald, which came into the University of Malaya’s collection (today the collection of the NUS Museum). While the motif of the pine, bamboo and plum blossoms symbolize steadfastness and resilience (and is used often as a designation of the characteristics of the motifs’ recipients), Wu had also cleverly played on the theme of winter and the appearance of the plants to turn the motif into a Christmas greeting to MacDonald (indicated by the colophon): the pine tree here takes the place of the pine of Noel, the plum blossoms and the bamboo leaves a visual play of the holly and the ivy.

Chang Yueh Siang
Curator
Lee Kong Chian Collection of Chinese Art, NUS Museum, Singapore
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The first survey of university museums in Thailand

YINGYOD LAPWONG

Abstract
The first university in Thailand was founded in 1917. After nearly a century, the number of universities has risen to 120 in 2012. These universities have established a diverse variety of museums in order to accomplish their specific missions. There have not however been any reviews of university museums in Thailand. Therefore, this study aimed to accumulate basic information about Thailand's university museums in terms of general characteristics, administrative structure, current status and limitations; the results of this can be analyzed for trends and suggest not only the current status of the university museum sector, but also avenues for new lines of enquiry.

Introduction
Since the founding of the first university in Thailand in 1917, the number of universities has risen to 120 in 2012 (OHEC 2012). Within many of these universities are university museums, yet there has never been a review of university museums in Thailand before the present study. The aim of this survey is to collate and understand this sector in terms of characteristics, administrative structure, current status and limitations. To accomplish the objective, basic information about university museums was initially roughly extracted from two sources: (a) the Local Museum Database and (b) by exploring university websites. Thereafter, specific information was collected by mail, phone or personal communication.

Only 71 out of 120 universities were identified as having their own museum(s). Universities lacking a museum are usually younger than 20 year-old, so might not have enough resources to establish a museum. Despite the low number of museum-hosting universities, the number of museums was high; 171 university museums were identified. For the purpose of this survey the museums were divided into six categories, namely Humanities & Social Science, Arts, Natural History, Science & Technology, Memorial Hall & Archive and Biography. As a result of the Office for National Education Standards and Quality Assessment's (ONESQA) policy, anthropological museums, sub-category of Humanities, contributed the largest number. The ONESQA has set Key Performance Indicators (KPIs) to assess quality of universities in Thailand (ONESQA 2012). One of the KPIs indicators is the level of culture promotion, accordingly, many universities established museum-like ‘cultural centers’ to respond this KPI. In addition, the result showed that the number of museums in a university potentially corresponded to the university’s ranking; the more museums, the better rank.

Furthermore, as will be discussed in this paper, the survey revealed that most museums lack good organization and get insufficient of human resources and adequate funding. However, the lack of policy, knowledge and experience also causes significant problems. More understanding about museum management, clear operating policies and collaboration between institutes are needed to solve this situation.

Methods
Initially, basic information of university museums in Thailand was collated from an existing database. In 2005, the Princess Maha Chakri Sirindhorn Anthropological Centre published a database of museums in Thailand called Local Museum Database. This online database gathered information of local museums from multimedia, including newspapers, magazines, brochures and webpages. It groups museums by several criteria, including content, location and responsible person. By using responsible person criteria, university museums are put together with school museums into a group of
museums managed by educational institutes. Names, types of collection and contact information were easily obtained from this database. Nevertheless, this digital database did not provide clear sources and dates of data achievements, furthermore it is out-of-date because several new museums have been founded in recent years. Therefore, a web search of official websites of the 120 universities in Thailand was undertaken although it was recognized that some small and new museums might not be mentioned in both the database and websites. Pearce and Simpson (2010) suggested that this condition would not contribute much impact to the research because those few museums would not significantly change the trends of data. After basic information of most of the university museums in the country was collected, a survey form was developed by the author and sent to a responsible person from each museum by mail (app. I).

Composition of university museums in Thailand
In this study, 172 university museums in 71 Thai universities were noted from the database and websites. However, the Gem and Jewelry Museum was then excluded because this museum is actually managed by a public organization despite its location in a campus of Chulalongkorn University, giving the final number of 171 museums. The quantity of museums in a university ranges from 1 to 23 (table 1).

<table>
<thead>
<tr>
<th>No. of museum</th>
<th>University</th>
<th>Abbr.</th>
<th>No. of museum</th>
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<td>Srinakharinwirot University</td>
<td>SWU</td>
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<tr>
<td>1</td>
<td>Christian University</td>
<td>CTU</td>
<td>1</td>
<td>Suan Dusit Rajabhat University</td>
<td>SDU</td>
</tr>
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</table>
Table 1 - Number of university museums in each of the 71 universities in Thailand (* RU = Rajabhat University / ** RMUT = Rajamangala University of Technology)

Interestingly, an initial reading of the number of museums in a university potentially corresponds to the university’s ranking by Quacquarelli Symonds (2012) and SCImago Research Group (2012); the more museums, the higher rank (table 2). There are several plausible explanations of this phenomenon. First, the universities with a higher ranking have more academic output, which may be conducive to the establishment of museums. Inversely, the higher rank of a university is an outcome of publications, which is supported by museums.

Table 2 - Correlation between the number of university museums and the university’s ranking

---

1 QUACQUARELLI SYMONDS 2012.  
2 SCIMAGO RESEARCH GROUP 2012  
3 Siriraj Hospital and Ramathibodi Hospital, which are parts of Mahidol University, ranked 9th and 12th, respectively.
According to the information collected, university museums in Thailand were divided into six categories, namely:

1. Humanities & Social Science – this kind of museum represents human condition and society. Artifacts and exhibitions on display in the museums imply evolution and creation of mankind. Humanities & Social Science were divided into 3 sub-categories, including Anthropology, Archeology and History.

2. Arts – Art galleries and art museums allow visitors to appreciate artworks on the university premises. The gallery focuses on aesthete while the museum mainly expresses history of arts. Additionally, there are also museums about music and architecture, which are included in this category.

3. Natural History – natural history museums transform the world of nature into tangible exhibitions. Also, another distinctive role of the museums is to support scientific research as reference collections. Natural history museums were simply divided into four sub-categories: Biology, Geology, Living Museum (Zoo, Botanical Park and Aquarium) and General Natural History.

4. Science & Technology – science and technology museums may offer similar content to natural history museums but usually focus more on the history of science, invention of technology and modern innovation. Their collections were not primarily developed to support research – but rather, document the process. Many science and technology museums display interactive exhibitions without any real artifacts. In Thai universities, science and technology museums cover medical science, pharmaceutical science, veterinary science, dental science and technology.

5. Memorial Hall & Archive – memorial halls and archives preserve the history of institutes in exhibitions and collections. Memorial halls usually outlining history while archives commonly conserve significant documents relating to the institutions.

6. Biography – biographical museums display personal information of particular people. In general, this kind of museum is devoted to founders and patrons of institutions, sometimes called ‘Halls of Fame’. They contain the biographies and achievements of people who have made a useful contribution to the institute.

As a result of the Office for National Education Standards and Quality Assessment’s (ONESQA) policy, anthropological museums, sub-category of Humanities & Social Science, contributed the largest number (49 museums). The ONESQA has set Key Performance Indicators (KPIs) to assess quality of universities in Thailand. One of the KPIs indicates the ability to promote culture; accordingly, many universities established museum-like ‘cultural centers’ to respond this KPI (ONESQA 2012).

In total, there are 61 museums in Humanities & Social Science, 9 museums in Arts, 32 museums in Natural History, 17 museums in Science & Technology, 34 museums in Memorial Hall & Archive and 18 museums in Biography (fig.1).
Despite being called ‘university museums’, they do not all report to the senior university management directly. In fact, some museums report to faculties, departments or other centers. Indeed, often, the museums run under offices that have equal status to a faculty; such as central libraries and cultural centers. The possible reason behind this situation is that the museums are not large enough to run as dependent units under senior university management. Furthermore, the content of the museums are specifically related to teaching and research activities; thus, they need specialists from the faculty to look after collections and exhibitions. Due to insufficient funding support, museums appear to have limited opportunity to sit within a department and so faculties have become the predominant organizations to operate university museums.

In this study, 81 museums from 43 universities sent back the survey forms, a return rate of just over 47%. However, some museums were managed as museum complexes, including the Mahidol University museum complex under the Library and Information Center and the museum complex under the Institute of Mekong-Salween Civilization Studies, Naresuan University, thus, a single survey was answered to represent each group of museums. In addition, the Princess Mother Memorial Center, Mae Fah Luang University returned a blank response due to its current status: under-construction and renovation. The Suranaree University of Technology Archives is also part of the Memorial Hall of Suranaree University of Technology. After removing these inactive responses from the collected data, 72 feedback forms were used as samples in this research. The samples were in a similar ratio to the total numbers (app. II). Therefore, the samples could, in all probability, represent all university museums in Thailand.

Resources

Infrastructure
People generally define a museum as buildings that houses collections and exhibit them to public (ALEXANDER & ALEXANDER 2008). Correspondingly, 70 from 72 museums in this survey are displaying at least one exhibition in their spaces; permanent, temporary or both. However, less than half of these museums have their own administrative offices, laboratories, database facilities or collection rooms. This means that many museums are putting up all of their collections in exhibition areas or other places that exhibit environmental risks. In addition there is often no opportunity to rest vulnerable objects or to work on conservation issues away from the exhibition spaces.

Finance
Many of university museums face financial and administrative limitations (DAVIS 1976; HUTTERER 2005; SILVERMAN & SINOPOLI 2011). The result of this study showed that financial status of Thai university museums may also be limited. 37 of 68 museums that participated replied that they do not have their own annual funds, and are supported occasionally by other agencies. The rest of the museums have very wide ranges of fund (from 1,000 to 10,000,000 baths) (app. III).
As a non-profit organization (ICOM 2007), most museums cannot rely or expect income from entry fees. Of the 71 university museums in Thailand, 61 (86% – app. III) museums have free entry. The other museums have maximum entry fees of only 100 baht. It can be concluded that entry fees do not contribute much to the museums’ financial status.

**Human resources**

Human resources are identified as another limiting factor for university museums (HERUC 2009). Twelve university museums in this study have no permanent employee. In fact, there are only four museums hiring more than ten workers, namely the Korat Fossil Museum (55), the Rajamangala University of Technology Srivijaya Aquarium (25), the Art-Centre, Silpakorn University (21) and the Southeast Asian Ceramics Museum (11) (app. III). However, there are several museums that do not operate independently but are instead parts of particular academic departments, faculties or centers. Hence, the museum’s officers do not take positions in the museums directly but undertake work in them.

In many museums, volunteer programs help to compensate human resource problems (HERUC 2009). However, volunteer programs are uncommon in Thai university museums; only 18 out of 69 museums have volunteers. There are three museums that have been successfully conducting volunteer programs, including the Korat Fossil Museum, the PSU Museum and the Southern Isan Cultural Center. These museums have 120, 60 and 33 participated volunteers, respectively.

**Collections**

Collections are a vital section of any museums (Alexander & Alexander 2008). From 72 museums, some could not define their collection sizes because they do not have databases. Living museums, like aquaria, also could not measure the precise number. There are two museums that do not own a set of artifacts; one based on exhibitions and a website, another is a gallery without a permanent collection. Finally, only 56 museums have given details about their collections sizes. The numbers of items are very varied, ranging from 10 to 300,000 items in a collection (app. III). The nature of the museum, financial and human resources appears to affect collection size.

In terms of specimen sources, averagely, the majority of specimens from 68 collections were garnered by the museums themselves (54%). In addition, donation contributed 33% of all specimens. Some museums also purchased specimens, accounting for 9%. The rest in the collections came from other minor sources (4%), including unknown sources, permanent loans, replicas and voucher specimens.

**Visitors**

The number of visitors appears to positively indicate a museum’s value. Therefore, museums research visitors (Bitgood & Shettel 1996; Jansen-Verbeke & Van Rekom 1996; Kotler & Kotler 2004; Everett & Barrett 2009). In this study, the number of visitors in each university museum in Thailand does not seem particularly high. Although some museums have more than 100,000 attendances annually, most of them still have less than 10,000 attendances in a year. In fact, two of the three most visited museums are actually aquariums (app. III). The result suggests that most of the museums, together with other related tourism agencies, still need to work out on marketing and public relation to increase visitation. In terms of accessibility, 68 of 71 university museums open for public at least five days a week, similar to other government offices. Among these museums, nine of them open also on Saturdays and Sundays. Additionally, most museums do not appear to target groups, and count them as just general visitors. HERUC (2009) suggested in her work that internal audiences should be

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targeted as a priority. University staff and students that are repeat visitors could potentially turn into loyal volunteers. However, King (2002) pointed that university students are among the most difficult visitors to engage with because they tend to spend most of their time in other activities and study classes.

Collaboration is probably one solution to build up more visitors. In case of the PSU Museum, the One Day Travel Two Cities Program was set up by a private organization in 2006 before the museum joined in 2011 (Thongpong 2011). This project formed traveling packages for schools in southern Thailand in order to promote educational tourism. There are various tourist destinations involving in this project, such as the Songkhla Zoo, the Thaksin Folklore Museum, the Songkhla Aquarium, etc. In the first half-year of participating (October 2011 to March 2012), 1,131 additional visitors recorded as having visited – compared to visitor numbers in a similar period prior to the commencement of this program.

**Policy & mission**

To accomplish set goals, a museum needs to formulate and carry out their policies and plans (Moore 1994). 42 out of 72 museums in this study do not appear to have their own policies. This condition is probably caused by a lack of knowledge about museum management by those charged with the responsibility of these sites.

According to Warhurst (1984), ICOM highlighted five general missions of a museum, which are “collecting”, “research”, “preserving”, “interpreting” and “exhibiting”, but university museums might have additional and unique missions compared to other types of museum. “Exhibition” and “specimens collection and preservation’ are still the main service of a museum, hence, nearly every museum in this study put up displays of their collections.

In contrast with the low number of visitors, most museums stated that they are working on “public relation programs”. Another two major duties are “special event organization” and “research support”; “workshop and training”, “educational program” and “research development”, are lesser roles. The result implies that most of universities in Thailand do not employ their museums in developing research. Hence it would appear that “teaching” is not considered.

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Fig. 2 - Number of museums working on each mission (71 answers)

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5 Thongpong, K. An introduction to the One Day Travel Two Cities Program (official letter). One Day Travel Two Cities Program 2011 [in Thai].

6 Lapwong, pers. comm. 2012.
as a direct function of university museums in Thailand, differing from the suggestion by Lourenço (2002).

The majority of these museums highlighted their significance in strengthening the image of their universities as public educational centers. Some reported their value in supporting teaching, research, student activities, public relations, and creating institutional appreciation. Remarkably, a couple of them detailed their potential to financially support the universities.

Collaboration with other institutes or networks is an indicator of a museum’s vitality. In this study, most museums were found to associate with at least one institute either in their own universities, in local areas or other national institutes. There are only four considerably larger museums, including the Chiang Rai Art Museum, the Korat Fossil Museum, the PSU Museum and the Thaksin Folklore Museum, connecting with foreign agencies. Six out of the 61 museums reported that they have not collaborated with anyone.

Limitation
50 out of 64 museums indicated human resources and financial insufficiency as their limitation. This is unsurprising because these two problems are obviously seen in other types of museums. More than ten museums pointed out problems with their operating space and systems as problems. Others cited limited location, policy, collaboration and public relation as difficulties. Two museums thought that they had no problem.

This part of the survey implied self-recognition of problems in each museum. Hence, the human resources and financial crises were recognized easily due to their close relation to working-life. In fact, the lack of policy is probably more serious because it could lead the museum in wrong directions. Museums with good policies should be managed well under any limitations.

In the part of comment and suggestion, some respondents gave interesting ideas. One commented about collaboration and network of museums in the country. He argued that there are several existing networks with similar objectives but they are led by different organizations, so the networks are overlapping and competing. Therefore, there is no unity and effectiveness in these networks. The reason for this is that different attitudes and understandings have led museums into unconnected networks; for instance, Museum Association of Thailand focuses on traditional museums, the National Discovery Museum Institute creates networks of local museums and the National Science Museum teams up with others to promote science and technology. There is no network of university museums. Furthermore, because of the abundance and diversity of museums in Thailand, it is difficult to have a single national network. In fact, the structure of ICOM may be a useful model for a large and diverse network in Thailand.

Another respondent was worried about the policies of the universities about their museums. Museum organization is usually not the university’s priority so lack of support can be a normal situation. Universities often have misapprehensions about the function and the importance of their museums which could lead the museums in different or conflicting directions. More understanding about museum management and clear operating policies are needed to address this situation. The same respondent additionally suggested that this problem should be solved at the national level. The Office of the Higher Education Commission should define the university museum and its roles clearly so universities could understand clearly the important roles of university museums and their management.
Conclusion
University museums in Thailand are very diverse; from tiny to very large, from poor to very rich, from old to very new, from unknown to famous and from struggling to well-organized. Many university museums, no matter how big or small they are, are facing problems and limitations. The museums in this survey considered their major weaknesses to be human resources and financial support.

Lack of policy, knowledge and experience could possibly be a significant cause of other problems. A strong network is an ideal tool to help those museums with problems by communication with experienced museums. However, it is a challenge to unify and pull them together in a network due to political issues. Structures of sub-committees were suggested to strengthen the network. Knowledge of museum studies should be made available to both working and governing staff to create proper policies and understanding about university museums.

This first survey of university museums in Thailand, by highlighting limitations, suggests directions for further research and collaboration to promote the diversity and educational potential of these underutilized museums.

Acknowledgements
Many thanks are due to all university museums involved in the survey; and to the Prince of Songkla University for support. Special thanks to Gina Hammond for comments on the language. Finally, thanks Chirabodee Tejasen for all suggestion.

Literature cited


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www.nhm.psu.ac.th/museum_en/
APPENDIX I - Survey form

No. of Survey
Survey of University Museums in Thailand
Description
This survey aims to gather basic information of university museums in Thailand. The analyzed results will create basic knowledge for further studies, promote and develop working strategies and solve any problems in operating particular museums. It will lead university museums in Thailand to be effective learning, entertaining and research support centers, corresponding to the universities’ missions. This survey is divided into 3 parts, including:

Part I  Basic information of the respondent
Part II  Basic information of the museum
Part III Operation information of the museum

I guarantee that this survey is conducted in order to use in research only and the result will not affect the respondent in any cases. I would like to thank you for giving your time to answer this survey.

MR YINGYOD LAPWONG
Scientist
Princess Maha Chakri Sirindhorn Natural History Museum
Prince of Songkla University

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<th>Basic information of the museum</th>
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<tr>
<td>1. Institute's Name.</td>
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<tr>
<td>☐ Under Department Faculty</td>
</tr>
<tr>
<td>☐ Others</td>
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| 3. Category                    |
| ☐ Humanities & Social Science (Anthropology, Archeology and History) |
| ☐ Arts                         |
| ☐ Natural History              |
| ☐ Science & Technology         |
| ☐ Memorial Hall & Archive      |
| ☐ Biography & Hall of Fame     |
4. Infrastructure

- Administration Office
- Laboratory
- Permanent Exhibition
- Temporary Exhibition
- Collection Room
- Database Facility
- Others

5. No. of employees________________________ No. of volunteers________________________

6. Fund & source of fund ______________________________________________________________________

7. Collection size________________________

8. Source of collection

- Self-collecting _________%
- Donation _________%
- Purchase _________%
- Others________________________

9. No. of visitors (annually)________________________

10. Target group of visitor________________________

11. Open hours________________________

12. Fee________________________

13. Official Contact Address

    Address________________________
    Tel________________________ Fax________________________
    E-mail________________________
    Website________________________
    Facebook________________________

Part III Operation information of the museum

1. Mission

- Exhibition display
- Public relation
- Specimens collection and preservation
- Special event organization
- Educational program
- Workshop & training
- Research development
- Research support
- Others

2. Does the museum have policies?________________________ (please attach the document if applicable)

3. Does the museum have any collaboration with others?________________________

4. What is the importance of the museum to the university?________________________
5. What are limitations of the museum?

______________________________________________________________________________________________
______________________________________________________________________________________________
______________________________________________________________________________________________
______________________________________________________________________________________________

6. Comment & suggestion

______________________________________________________________________________________________
______________________________________________________________________________________________
______________________________________________________________________________________________
______________________________________________________________________________________________

7. Would you like to join the Thailand’s university museum network?

- Please attach any brochures or advertising document if applicable
APPENDIX II - Comparison between composition of sampling and actual data

Fig. 3 - Comparison of percentages presented of each museum type between the sampling and the actual data

Fig. 4 - Comparison of percentages presented of each museum’s operation status between the sampling and the actual data
# APPENDIX III - Details of university museums in this survey

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<thead>
<tr>
<th>No.</th>
<th>English Name</th>
<th>University</th>
<th>Employees</th>
<th>Volunteers</th>
<th>Fund ($)</th>
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<td>Annual Education Activities</td>
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Refusing to stand still, reaching out to the public: The Art Museum of the Chinese University of Hong Kong’s current public outreach efforts and its possible future directions

CHAN LAI-PIK

Abstract
The Chinese art collections and exhibitions of the Art Museum of the Chinese University of Hong Kong are known for high artistic and educational standards. However, historically, the general public has not been closely involved with the museum because of its distant location from the centre of the city and its strong academic reputation. In this paper, the author, who contributed to the show and in planning outreach programs, will introduce education and outreach strategies to facilitate the promotion of the exhibition and to encourage public engagement with the museum. She will give suggestions and her vision for the future.

Introduction
The Art Museum of the Chinese University of Hong Kong (CUHK) was established in 1970 to promote Chinese art and culture. It also is widely considered as one of the leading teaching university art museums in Asia, collaborating closely with the Fine Arts Department and providing a platform for students and scholars to research its permanent collections (CHENG 2000, 130–140, 230–232).

The Art Museum is located in the New Territories of Hong Kong, which is one hour distant from the centre of the city. However, it is well located within the campus. It is right next to the major avenue of the main campus – the busiest place in the university where many students and university community members pass by every day.

The Chinese art collections and exhibitions at the Art Museum of the Chinese University of Hong Kong are known for their high artistic and educational standards. However, historically, the general public has not been closely involved with the museum because of its distant location from the centre of the city and its strong academic reputation. Currently, efforts are being made to make the public more aware of the museum. For example, recently the Art Museum co-organized a large-scale exhibition with The Oriental Ceramic Society of Hong Kong entitled Divine power: Dragon in Chinese Art. This exhibition featured more than 300 artefacts from the Neolithic period to the 20th century, including ceramics, bronzes, gold and silver wares, jade, glass, lacquer ware, paintings and textiles. It has been called one of the largest and best dragon-related Chinese art exhibitions in Asia.
The university art museum has more than 40 years of history and a reputation of strong academic achievements. However, is it time to review the museum’s education and outreach program? Is it time for a change?

In 2008 Barack Obama’s presidential campaign in the United States used the slogan “Change we can believe in”. To certain extent, this is an idea that can be borrowed for any established institution to review its current situation and make changes that will make it better. In the case of the Art Museum of CUHK, we believe that it is very important to preserve the cultural identity of the museum, and the distinct academic achievement that has been accumulated for more than four decades. At the same time, it is also important to keep pace with the ever-changing world and be ready to deal with the new challenges of the 21st century.

The Art Museum of CUHK decided to launch a series of new education and outreach programs for the dragon exhibition. These outreach efforts included public lectures, workshops, guided tours, a virtual museum tour for mobile phones, a student ambassador training workshop, summer programs and art competitions. These programs were an attempt to transform a seemingly primarily academic institution into one that was audience-friendly – while continuing to serve university students. Public outreach efforts were successful, and registrants for guided tours increased fourfold within a month.

In this paper, the author who closely involved in the dragon show and in planning these outreach programs will introduce the educational and outreach strategies for this exhibition, and give her suggestions and vision for the future.

In the first section, she first discusses a case study of the current out-reach effort. In the second section of the paper, she will then reflect on her understanding of an identity of a university art museum and her suggestions on possible future directions of education and outreach programs.

Section I

1.1 Expectations from the audiences

Since the Art Museum of CUHK is distant from the centre of the city, all of the outreach programs aimed at attracting visitors to come to the Art Museum again and again. The Art Museum of CUHK has a good tradition of providing guided tours for student and local communities, but this is not sufficient to attract more visitors to come. In order to increase engagement with students and university staff in the campus, we launched several new programs such as a student ambassador program that encouraged students themselves to be tour-guides. Moreover, a series of follow-up activities were conducted to stimulate frequent visits. For instance, after they had attended the artwork and design workshop, participants could apply the skills they learned and enter art competitions.

Marketing should always play an important role in designing outreach and education programs. It can be viewed from three aspects: 1) program design 2) product design and 3) promotion to different targeted audiences.

1.2 Museum marketing

1.2.1 Marketing on program design

The 41 years before 2012, the Art Museum of CUHK held many lectures for academics and the general public. However, most of them could be considered academic in nature. The outreach and education committee noticed this and from the first meetings of the team, proposed a variety of topics that were not limited to visual arts, but included literature, music, history, local religions and food culture. Since the exhibition lasted for ten months, a new theme was designated for each month and interesting lectures and workshops were planned around the themes. Activities were conducted not
only on campus, but also in the centre of the city, thus reaching a larger audience. And hopefully, the participants would come to visit the museum after the lectures.

1.2.2 Marketing on the product design
If the audience can take a souvenir home, those can remind them of the pleasant time they experienced at the museum. The outreach committee took the Dragon exhibition as a starting point and designed museum souvenirs, such as t-shirts, cups and paper fans. Other nicely designed products included stickers, puzzles and file clips.

We also set up a mascot design competition on campus, and the winner designed a dragon mascot that wears an imperial robe and opens its arms, welcoming everyone.

![Fig. 2 - Souvenirs designed by Eric Leung and Chan Lai Pik](image)

1.2.3 Marketing on targeted audiences
Who are the target audiences for the university museum? What kinds of knowledge we want to give them? And what do audiences actually need? The dragon exhibition has been attracted 140,000 visitors in total. The distribution of types of audiences is as follows.

Thirty-five percent of participants were primary and secondary school students, the single largest audience for the show. Since a transportation subsidy that schools can apply for was launched university museum visits became the favourite school extra-curriculum activity. Other community social services groups, such as elderly groups were 25% of the attendees. University students and staff members were 14%.

Collectors play an important role in the art museum as donors. They also provide loans of their collections to the museum for academic research and exhibits. Collectors groups made up 6% of the visitors. Twenty percent of visitors did not fit any of these categories, and were designated as “others”.

I would like to use a triangle diagram to explain the relationship of different types of audiences with the Art Museum. As a university museum, university students and staff members should be the first priority group. As a teaching museum, students who study art history, scholars and people in the
Distribution of Audiences for the Dragon Show

Fig. 3 – Distribution of the audiences in the exhibition Divine Power: the Dragon in Chinese Art

related academic fields can put on one side of the triangle, and groups such as students from local schools and the elderly can be placed another end of the triangle. Art-lovers and collectors can be put on the third side.

I would suggest several marketing plans for education and outreach programs in the near future. First, it is important to identify and prioritize targeted audiences. Second, short-term and long-term plans for education and outreach programs are necessary for both academia and local communities, such as the docent training program, the student ambassador program, the object handling and study workshop, and museum professional enhancement schemes. Third, it is also good to bear in mind that education and outreach programs should be thought of from the beginning when we curate an exhibit.

1.3 Suggestions and evaluation of current education and outreach program

In this section, I will discuss five possible future directions for designing the educational and outreach programs in a university art museum. It includes virtual museum and digital media, targeted members, collaborations with other programs on the campus and venues for publicity.

1.3.1 Digital world

It is important to develop twenty-first century digital assets for the museums. I am committed to developing new digital assets, such as a cell phone app for the museum. The free app has been launched in December 2012. It not only shows the strength of our collections, but also serves as a trilingual tour guide. We have a Facebook page that helps docents communicate. Of course, like most museums, we have our own bilingual webpage.

I would also like to mention two interesting projects. One is the Song and Yuan project at the Freer and Sackler galleries.¹ Audiences and scholars can access online the inscriptions of their very strong Chinese painting collections. It helps tremendously for academic research and art appreciation. The other one is an online scholarly catalogue from the Getty Centre run by several museums in North America.² This is different from the printed catalogue but is a constantly growing and changing catalogue. Scholars and the general public can participate in writing sections. It brings lots of interaction between academia and the general public. The above projects are both ambitious yet useful for the audiences and scholars to conduct research, or to learn more about arts via Internet.

At a university museum it is very important to have an online database and a search engine so that knowledge can be spread easily. The Art Museum of CUHK does not have an online database yet, but this should be considered a priority for university museums in the near future.

¹ www.asia.si.edu/songyuan/ (accessed November 1, 2012).
Virtual museums have proliferated in the last decade, and the trend of virtual museums such as Google Art Project will be prevalent in the 21st century. We believe that this kind of project should not exclude university museums because they play a key role in producing knowledge. So far the Google Art Project's team has already launched two phases of the project, and most of the participants are national museums. Hopefully, university museums can be part of it in the near future.

1.3.2 Venue and spaces
As mentioned above, the Art Museum of CUHK is well located on the campus, right next to the main avenue of the university. Students at CUHK have been very creative in using space. In fact, the avenue can actually accommodate 5,000 people at the same time. In 2012 students used it for a protest, for promoting different social clubs and a variety of performances and competitions.

Fig. 4 – Open spaces at the Art Museum, Institute of Chinese Studies, The Chinese University of Hong Kong

It is very important to understand that the university museum is not limited to its physical building, but also can use the surrounding spaces. If we can use spaces around the building that means we can give students and other people nearby easier interaction with the museum. Can we be more flexible and creative in using surrounding space for the programs of the university museum? Is it possible to use the public space for recreational functions, such as setting up booths for promoting the museum, and creating a space for students to take a rest and enter the museum?

1.3.3 Target audiences
The outreach and educational programs of the Art Museum of CUHK have so far involved different types of audiences such as students from kindergartens, the elderly and students at CUHK. However, our program is still experimental and no priority for our target audiences has yet been set. How can we skilfully use museum resources for targeted audiences, and what kinds of programs can we present tailor-made for them?

For example, the Art Museum has a program to reach out to the elderly. We provide replicas of artefacts and games for the elderly to play with. They really enjoyed this activity and increasing numbers of groups requested visits to the museum afterwards.

As early as 1913, John Alfred Charlton Deas, a former curator at Sunderland Museum in England, organized several hands-on sessions for the blind, first offering an invitation to children from the Sunderland Council Blind School for hands-on sessions with some of their collections. They were so successful that Deas went on to develop and arrange a course of regular hands-on sessions,
extending the invitations to blind adults. The Art Museum of CUHK did several guided tours for blind adults as well, and they enjoyed the tours very much. They first heard the story behind the artefacts, and then touched replicas that we prepared for them to handle.

1.3.4 Collaboration with different art-related units in the campus

There are many art-related functions on campus, some of which duplicate each other. For efficient use of university resources, is it possible for the university museum to collaborate with different existing art-related units in the university?

It is surprising that at least three student ambassador programs have been taken place at CUHK at the same time. For instance, one is at the university art museum, another one is at the performing centre of the CUHK, and the last one is designed for the college exchange program. If universities would pay more attention and encourage the collaboration of different cultural units on campus, this would be highly beneficial to students.

1.3.5 Creative use of space

Recently the Art Museum held a Chinese musical instrument performance in one of the three-storey galleries, designed by the famous architect I. M. Pei in the 1960s (CHENG 2000, 60–62). The professional performers said that this is a perfect venue for Chinese music performances as the acoustics are excellent. In fact, we could also consider other types of performances that are suitable for both indoor and outdoor venues. Outside the Art Museum, there is a nice corridor in the garden. It could be used to perform Chinese opera, jazz music or even other types of soft ‘pop music’. Music has added another layer of audiences that can potentially be museum visitors. But the most important thing we have to consider is that sounds would not bring any potential harm to the artefacts.

Section II

2.1 The role of a university art museum

In this section, I will review briefly the role and the functions of a university art museum. A university art museum is somehow different from a national or regional art museum. It is highly linked with the university. It shares knowledge and beauty with the audience within an academic institution, and it inspires innovation.

The Art Museum of CUHK is part of the Institute of Chinese Studies (ICS). Its logo tells the story. It is a Chinese ornamental motif. On one end it links up with tradition and the East, on the other end it links to modernity and the West. Therefore, the Institute of Chinese Studies serves as a bridge to connect the traditional and the modern in its research (CHENG 2000, 157–179).

I would suggest three essential functions of a university art museum as follows. Firstly, the university art museum is not an independent museum, but it represents the university. Therefore, it is also important to consider what the benefits to the university are of supporting a museum on campus. Secondly, the university art museum inspires human wisdom and creativity. Its curatorial directions can be related to academic research and the creation of knowledge discoveries of the parent university.

Thirdly, the university art museum merges traditions and current knowledge together, and contributes to the creation of new knowledge for society.

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From the perspective of the academic achievements of a university, and the ways it is related to the museum, I would suggest two feasible curatorial examples for references.

2.2 Curating exhibitions, promoting university
Chinese medical research at the Chinese University of Hong Kong has a very high standard among institutes around the world. This is one of the research strengths of CUHK. Can the art museum of CUHK, with many precious Chinese artefacts in its collection, collaborate with the department of Chinese medicine? Can the Art Museum curate a show, illustrating the wisdom of Chinese medicine by showing nice herb drawers, medical bowls and related utensils? This kind of exhibition could demonstrate the wisdom of Chinese medicine throughout the ages by showing precious medical antiquities and also introduce the pioneering scientific research at CUHK.

Thanks to the father of fibre optics, Professor Charles Kao, all of us can be connected in the Internet. He was one of the vice-presidents at the Chinese University of Hong Kong. He discovered the light reflection of glass that led to the invention of fibre and he put forward the “optical communications” theory. Chinese ancient wisdom on light reflecting artefacts can be found as early as the Bronze Age. How can we use the beautiful bronze mirror collection at CUHK and demonstrate the wisdom of people both today and the past and at the same time, highlight the achievements of the university?

Conclusion
To conclude this paper, firstly, the university art museum should preserve heritage and traditions, but it also has to be innovative and reach a wide variety of potential audiences.

Secondly, it is important to prioritize the target audiences, and then design tailor-made education programs for them.

Thirdly, short-term and long-term strategic plans are needed for education and outreach programs. It is also good to use outreach programs to compliment the curatorial aspects of exhibitions.

Fourthly, make use of digital media.

Fifthly, demonstrate the most important achievements of your university through your university art museum.

Acknowledgements
I would like to express my heartfelt gratitude to the directorship of Prof. Peter Lam for the outreach program at the Art Museum, and to our museum’s important benefactor and the chair of the management committee, Mr. Christopher Mok, for his unflagging support to outreach and education programs. I also want to give thanks to each members of the team of the outreach and education program, the curatorial team, and in-house designer Eric Leung. Special thanks go to the Bei Shan Tang Foundation for her generosity in supporting my research and attendance at the conference. Thank you also to the UMAC conference committee for the opportunity to present the paper. Thank you very much.

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The University of Amsterdam HeritageLab (ErfgoedLab). A learning space

STEPP SCHOLTEN

Abstract
At the Heritage Collections department of the University of Amsterdam, a leftover space was designated in early 2010 as a temporary laboratory for experimentation with heritage concepts, collections and audiences, in the framework of developing plans for renewing the concept and presentations of the archaeological museum. A series of projects have been executed, each in close collaboration with staff and students from different faculties. The HeritageLab has turned out to be an interesting alternative platform for visualizing and presenting research as well as an excellent tool for communication between a university museum and academic education and science.

Introduction
At the 2011 UNIVERSEUM conference in Padova, Italy, this author presented a paper during which this image was shown (fig. 1).

It was argued that university museums and collections need to be relevant in two domains: in representing the university and in at least one part of the core business of the university: education and/or science. If they do not do that, the relevance of the collections for the university will, sooner or later, be questioned and if this happens, funding will come into question (SCHOLTEN 2011).

At the University of Amsterdam, this scenario was feared to become reality for its archaeological museum. This so-called Allard Pierson Museum has been part of the university since 1934, but it had slowly but surely drifted from its academic moorings. More and more it was becoming an entity of its own, and one that rarely publicly acknowledged that it was actually part of the university. Its relationship with faculty and university board had become strained. At the same time that this author was appointed overall director of (almost) all heritage collections of the university, in February 2009, a new director for the museum, Dr Wim Hupperetz, was appointed as well. It was clear to us that we urgently needed to improve the position of the museum. Plans for a major refurbishment of both the buildings and the exhibitions were developed, but such plans require lots of time and money before they can be realized. By the end of 2012 we have been able to complete the first phases, including expanding the spaces for temporary exhibitions from 180 to almost 500 square meters, creating a new museum shop, new office spaces for staff and a VIP room for our benefactors as well as cosmetically improving many of the museum spaces. It is a step-by-step process, the speed of which is determined by the available money and the cooperation of many officials within and outside the university in charge of building and financial issues. At this point we still need seven million euro or so to complete the refurbishment.

Fig. 1 - Modeling values of academic collections © S. Scholten

The invention of the HeritageLab

But besides all kinds of practical issues, the museum needed to adapt its focus. It has been on its present location since 1976 and it has done well for a long time, but it has lost part of its drive and its connection to the university in the 21st century. The new director of the museum came up with the idea to create a space where we could experiment on a small scale with new ideas and concepts for the museum. He felt it appropriate for an academic museum to call it a laboratory, a place for experimentation. We found a perfect spot in our buildings, right in the middle. It was a kind of leftover, not very practical space that was used for storage of the Christmas decorations and other material (fig. 2).

Funding was applied for and a grant for ‘cultural innovation’ was awarded by the Mondriaan Foundation, a public funding body.2 With this grant, a coordinator could be recruited for two days a week for three years. Mr. Jan Bolten was appointed, a young talent who previously had been teaching in the universities museology master course. He started in early 2010, so his term is now almost at its end. A sum of 20,000 euro per year was made available from the regular budget to run the activities in the HeritageLab. The purpose of the HeritageLab was defined as: “Bringing the past to the present: a space for research and experimentation. The aim of the UvA ErfgoedLab is to explore the interaction between heritage, collections, science and audiences. As a platform for research and experimentation, it brings together scientists, students and artists to present exhibitions on a variety of themes related to heritage”.3

The first project

The very first project was connected to a regular exhibition on a very famous 19th century Dutch book on colonialism.4 Five students from five different master degree programs participated: history, literature, museology, sociology and theatre. Together they formed a great group that attracted the attention of the board of the university when they launched a successful campaign for fair trade food in the cafeterias and restaurants of the University of Amsterdam. They also produced a lecture series, a small exhibition and even a half hour theatre show. Through this, the attention of many staff members in different faculties was caught. At the same time, we went around to many receptions talking about the HeritageLab concept to a great number of professors and academic staff. It turned out that many loved the idea of having a different platform than the traditional ones they have in an academic setting: writing articles for journals, presenting papers at conferences or lecturing. The HeritageLab concept provided a possibility to share their research with a larger audience. And that has turned out to be one of the main attractions: the HeritageLab is, most of the time, accessible for the general public that comes to visit our exhibitions. The HeritageLab space is directly connected to our exhibitions rooms via a sliding door that we have gradually opened more and more often, leading to vivid interaction with

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3 UvA ErfgoedLab, Max Havelaar Academie 2010, Amsterdam 2011, p. 9. Translated freely from Dutch into English by the author of this article.
4 The so-called Max Havelaar by Multatuli from 1860, a book that was considered important enough to be nominated for inclusion in the Memory of the World Register of UNESCO in 2010.
audiences during projects. For educational purposes it turned out also to be attractive: students in different fields can make small, more or less traditional exhibitions or whatever it is that they want to develop in the space. In several projects the HeritageLab has been used as a real working space, e.g. experimenting with modern lighting for exhibitions, crowdsourcing biographies from women from Dutch history (fig. 3) or developing concepts for the presentation of archaeological finds in a new subway station that is under construction very near the museum.

Other projects
Since the start in 2010 up to November 2012, 14 projects have been realised. Projects are short, typically between two and twelve weeks, and have come from the following fields: archaeology (4), museology (2), history (2), media studies (1), conservation (3), computer science (1) and art history (1). Three projects involved work of contemporary artists (fig. 4), some specifically made for the HeritageLab. Almost all projects have a connected program of lectures and/or debates. Most projects have been documented in simple, low cost publications. On the HeritageLab Facebook fanpage some information on most projects can be found.5

Every project not only has an angle that is interesting for the scholars or students involved, but also addresses a particular issue that we find interesting for the development of our museum concept. This can be the way that audiences interact with virtual devices in exhibitions or how information about the conservation and restoration of museum objects can be presented to a general audience in a meaningful way. It can address questions about the relevance of crowdsourcing for historical data creation or if contemporary art can be used in a meaningful way in archaeological exhibitions.

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Results and conclusions
The concept of the HeritageLab has become part of our strategy to establish, in part anew, the museum as a relevant platform for the core business of the university: research and education. It has helped in the development of the plans for the renewal of the museum. We have gone so far as to design a number of ‘Lab type’ spaces in our plans for the new museum, thus establishing research and education also physically as the core business of a university museum. It has also helped us realize that for an academic museum an open, curious, experimental mindset is of great help when relating to research and education. It has enabled us to make a connection with a number of research projects within the university and on a European level. We now share two PhD positions with the faculty and two more are expected to be hired in the near future. The HeritageLab concept has proven to provide a useful alternative academic platform for students and staff. It has proven to be an excellent communication tool, leading to increased involvement of faculties. Negotiations are on the way with the Humanities Faculty about including the HeritageLab concept in their extensive Heritage and Identities research program and funding it in part from it. The HeritageLab concept has literally become the core of renovation plan for the museum. And, maybe most important: the HeritageLab is not so much a space, but a mindset for all activity.

Acknowledgements
I would like to thank Dr Wim Hupperetz, director of the Allard Pierson Museum, and Jan Bolten, MA, coordinator of the University of Amsterdam HeritageLab, for their creativity and perseverance in the development of this great concept.

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Spaces of BLISS. BLISS Market project and/at the University of the Philippines Vargas Museum

LOUISE ANNE D. MARCELINO

Abstract

This paper is a case study of the community arts project BLISS Market and the involvement of the University of the Philippines Vargas Museum in such an endeavour. Fostering a multidisciplinary orientation, the project gathered artists, educators, and students to engage with the community’s spaces and reassert its presence as a place for exchange. It utilized pockets of the actual site and transferred the exhibition to the Vargas Museum as a form of documentation and as indication of work-in-progress. This study considers the impact of hosting the project within a university museum’s four walls.

Setting the scene: UP BLISS

Under the aegis of the dictatorial regime in the 1970s, the Ministry of Human Settlements introduced a shelter program that would fulfill basic housing needs. The housing project called the Bagong Lipunan (New Society) Improvement of Sites and Services (BLISS) was envisioned as a self-sustaining program that would help foster the development of its residents while serving as a model urban community. Former First Lady Imelda Marcos, who led the ministry in 1979, planned for the settlement to house 50 to 100 families in a two-and-a-half hectare area (LICO 2008). Despite the instability of the times, its offerings were promising for both low and middle-income families alike. The residents were to receive subsidies, livelihood opportunities and services, and the formation of a close-knit community was facilitated by inviting members to participate in group activities promoted by duly registered community associations. The physical dwellings were standard building types comprised of several floors, each building consisting of 16 to 32 units, with communal areas such as basketball and tennis courts, a multi-purpose hall, and a market. Whether out of sheer necessity, or a personal volition to socialize, residents congregated in these spaces and a community spirit somehow flourished.

Decades later, government support faltered, and the exemplar of urban housing fell into neglect. One existing BLISS site, situated at the University of the Philippines (UP) campus in Quezon City, north of the capital Manila, is a case in point. J. Pacena, an artist and former resident who grew up in UP

Fig. 1 - BLISS Market – Photo: Rod Dumas © J. Pacena
BLISS has observed that the community, once vibrant and active, had eventually lost its sense of gathering. Residents began to struggle with everyday realities, experiencing insecurity as the threat of being displaced heightens every year. They also face a growing divide between a nearby community where a number of informal settlers have set up base. In 2007, BLISS Market, a small but central structure was demolished, leaving behind traces where interaction and the exchange of goods once took place (fig. 1).

Drawing on the market as a symbol of the past and as an evocation of activity, J. Pacena initiated a community-based project by engaging artists, architects, educators, performers, filmmakers, and students, among other creative practitioners to react to quotidian spaces – specifically in the spaces of BLISS. There are 29 artists and groups who participated in this project. The artists who were mostly outsiders, were oriented to the community through visits and constant interaction with the residents. The immersion of artists was facilitated by J. Pacena and assisted by the Senior Citizens group who are insiders of the community. The art production workshops initiated by the Philippine Association of Printmakers and a shadow play collective for instance, invited the participation of children, teenagers, and adults alike to learn new creative techniques and to draw inspiration from their experience of home or community. Some artists responded to the site by creating murals that arrest attention as in Rai Cruz’s Robobliss, segments of a creature with robot-like features interspersed at the various areas of UP BLISS (fig. 2). A team of architects, on the other hand, proposed plans on the improvement of place, one that will reconfigure communal spaces like the multi-purpose hall, make them more inviting and to entice people to gather. Poetry that touches on the social and economic nuances of everyday life, written in the vernacular can be seen posted as banners in the buildings of UP BLISS. A series of activities like the bazaar held at the ruins of the defunct BLISS Market; film showings initiated by an alternative group of filmmakers who focus on the plight of marginalized sectors in urban communities; and concerts provide opportunities for the community to interact face-to-face, to familiarize themselves to one another, and to enliven the place. Perhaps, these string of activities were imagined to revive the impact and intensity of camaraderie facilitated by social gatherings in UP BLISS decades ago.

Commencing in early 2012, the project endeavored to revitalize the community’s sense of place and revive the UP BLISS neighborhood as a place for exchange. BLISS Market: Exchange in time, space of transience occupied pockets of the actual site and transferred the exhibition to the Vargas Museum as a form of documentation and as an indication of a work-in-progress.
In this essay, I attempt to shed light on the implications of the project with respect to the Vargas Museum in terms of (1) its notions of the community and the public it addresses. It also tries to (2) speculate on how museums might revolutionize our understanding of art or artistic practice, and how it can challenge commonly held views on what constitutes the exhibitionary or the museal. This is a modest effort to trace connections between a particular kind of public art and shifting museum-based practices; to describe their encounter and point out disparities. These points of reflection spill over to the mandate of the Vargas as a university museum and its aspiration to sustain a contemporary art program.

The Vargas Museum and its contemporary art programs
The Vargas is the main museum of the University of the Philippines and the largest in Quezon City. Its permanent exhibition is centralized on the collection of Jorge B. Vargas, a politician who donated art, memorabilia, archives, and library to his alma mater in 1978. The benefactor was the Philippines' first Executive Secretary and the Mayor of Manila during the Commonwealth period in 1935 and the Japanese-sponsored republic in 1942. The art collection spans the works of Filipino artists from the late 19th century to the 1960s and maps significant points in Philippine art history. The modern art collection is exhibited alongside works of contemporary art to link past and present expressions. The other venues of the museum are committed to temporary exhibitions of contemporary art; programs are being developed in such a way that the permanent collection, including the archives, engages in dialogue with each other. Like many public museums, the Vargas is an object-based institution that relies on the physicality of material to generate research and facilitate knowledge production. These materials of history and heritage enable the museum to abide by its mandate in preservation, research, interpretation, and education. As part of an academic institution, its objects serve as a teaching collection while the museum also functions as laboratory for students, faculty, and researchers especially in art studies, among a host of other disciplines. The museum's programs seek to address the university community, beyond what Vargas had envisioned. Through its contemporary art and education programs, the Vargas likewise endeavors to respond to the broader public aside from artists and experts. It facilitates opportunities for experimental practices and presents new possibilities for curation. The conceptual framework for Bliss Market evolved from a curatorial workshop attended by the artist, along with emerging and senior practitioners at the Vargas Museum in 2009.

Public engagement: The artist, museum, and community
As a scholar of museum studies Elizabeth Crooke (2011) has pointed out, the terms ‘community’ and creating an ‘inclusive community’ have become in vogue in art and museum sectors. This relates to the recognition of the transformative function of art or the commonly held view that it can serve as a catalyst for social change. Both locations adopted by the Bliss Market project draw its potency and contingency from communities. At the heart of the project is a compelling drive from the artist, an insider, to flesh out and address social concerns shared by the residents. The project was undertaken as a matter of urgency, and its nature was intended to yield unconventional forms or outcomes. The initial stages of the project, marked by immersion and research at the actual spaces of BLISS, were followed by art intervention activities that involved the following actors: the artist-curator who also serves as a context-producer, participating artists, key members of the community such as the UP BLISS Senior Citizen Achievers Chapter, residents, and visitors. The project was intended to be ephemeral, process-based, collaborative or supportive in approach. It had the ambition of giving its residents a wake-up call by disrupting mundane habits and by re-creating the experience of spaces anew. It attempted to address public issues especially those that had to do with the residence as place and as a living, evolving space. The project placed emphasis on dialogue and fostering partnerships,
while the creative, tangible, and permanent components have become almost secondary. Given the
number of artists and stakeholders involved in the project, the role of the artist became decentralized.
Rather, it has become multifarious in scope as one role overlaps with the other. In the case of BLISS
Market, the artist may have functioned also as a social worker, an activist, an organizer, a facilitator, a
confidante, an events manager, and so forth. As to whether the goals of the project in transforming the
UP BLISS residents into a responsive, engaging community have been met is another point of inquiry
that deserves a lengthier discussion.

The concept of a museum as a unit that belongs to a wider constellation of institutions and public life,
is inextricably linked with its communities. As many museum theorists have observed, museums
continue to develop programs that open themselves to a wider variety of audiences. As such,
narratives and interpretation draw from multiple voices rather than from a single, authoritative
standpoint. This gesture demonstrates the democratizing tendency of the museum and its ability to
revise itself in response to the needs of contemporary social life. While the Vargas Museum’s
immediate public is the university community, there have been efforts to extend its reach, as
exemplified by contemporary art exhibitions like BLISS Market. The Vargas Museum, however, does
not merely serve as a vessel that hosts the exhibit as a matter of routine programming, but plays an
active role in shaping or influencing curatorial practices. The physical transfer of the project reveals
several transformations. Firstly, the transposition of traces (objects, experience, or knowledge) from
the community settlement to the museum implies the transfer from one ideological space to another,
and hence a different manner of beholding. BLISS housing is based on a design and grand narrative
perpetuated by the Ministry of Settlements which impacts on the community’s ways of living in much
the same way that the museum, as a framing device, influences the way objects and artworks are
interpreted. Secondly, narratives of private, individual lives become part of a public display, and
integrated as history as a consequence of the museum’s value-imbuing tendency. Finally, the
museum is inclined to convert to material form, the processes, performance, events, and other
intangibles through methods of archiving and display. This is manifested in video footage, papers
compiled methodically, artworks produced in workshops, and photographs lined in the museum’s
perimeter to evoke a semblance of a walk-through. These examples strongly indicate the museum’s
adherence to object-based practices.

When the BLISS Market exhibit at the Vargas Museum was formally opened, members of the
community attended the exhibition opening. The exhibition drew residents away from their comfort
zone and into the museum, where their efforts were shown, their identities revealed, and their sense of
belonging to the BLISS community was portrayed. While there is a tendency for the museum to
downplay certain issues, the exhibition testified to its potential to empower ordinary people and signal
the significance of the commonplace. Rod Dumas, a resident of BLISS and a hobbyist who had a
penchant for taking photographs of his neighborhood left his collection of prints to J. Pacena. These
images chart the changes in BLISS from the 1970s until Dumas’s recent passing. The prints, lined up
as an installation in the ground floor of the museum recognized the humble efforts of an assiduous
chronicler who captured memories of place.

Future possibilities: Participatory projects initiated by university museums
At a time when the lines between art and everyday life are becoming indistinguishable, institutions that
signify power over culture and meanings still remain. I end this essay with the following questions as a
springboard for further discussion: What happens when a time-based, participative work, which aims
to resist the ideology of the market or an institution, becomes embraced by either one? Is it in the
nature of university museums to afford a degree of open-mindedness or experimentation in its
projects? Where will experimentation take university museums and how will it affect current and more
conventional modes of practice? These queries invite us to reflect on the path to which university museums may tread in the future.

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Australia’s first university sporting museum: a case study

DEIDRE ANDERSON, LAURA GIBERSON, ANDREW SIMPSON & ASHLEIGH THOMSON

Abstract

Expansion of sporting facilities provided an opportunity to develop a new museum, the Macquarie University Sporting Hall of Fame Museum. This came from a decision to build linkages with sporting alumni to develop a distinct sense of institutional identity and instil a sense of pride and endowment in the Macquarie University community. Museum studies student interns were responsible for reconnecting with alumni of various sporting clubs to seek out stories and objects.

While sporting museums are known in the higher education sector in other parts of the world, most Australian university museums have grown from discipline-specific teaching collections.

Introduction: The university context

Many authors (e.g. CHATTERJEE 2010, SIMPSON 2012a) have noted that university museums typically have their antecedents in teaching collections developed to underpin instructional pedagogies in discipline specific teaching programs.¹

Macquarie University, in Sydney, Australia, is a medium sized tertiary education institution with just under a total of 40,000 internal and external students. It was the third university to be established in the greater Sydney region and is approaching its 50th anniversary in 2014.

Macquarie University has a number of museums that are derived from traditional origins in areas such as ancient history (Museum of Ancient Cultures), modern history (Australian History Museum) and biology (Biological Sciences Museum). A number of factors combined in 2006 to allow the development of a new museum, the Macquarie University Sporting Hall of Fame Museum, with an entirely different philosophy and purpose completely unconstrained by any specific academic discipline.

In terms of historic data, a work on the early history of the university’s Sports Association (PHILLIPS 1995) provided a useful baseline. In more recent times, however, the activities of the Sports Association’s groups were not documented. More importantly, there was no sense of any integration into a broader institutional narrative, the individual histories of the groups were disparate and unrelated to each other or the parent organisation, Macquarie University. The tangible heritage of these groups was dispersed among individuals who previously or, in some cases, were still active within the sporting clubs. The intangible heritage of these groups consisted of memories, stories and recollections of participating individuals. It was likely that without an effort to capture and integrate this, much would have been permanently lost.

In 2006, under new management, there was a significant expansion of sporting facilities at Macquarie University including the development of a new aquatic centre. A small area connecting the existing facilities with the new development was identified as a suitable space to showcase this sporting narrative. Management of the Sports Association linked up with the university’s museum studies program. Postgraduate students can undertake substantial project work as part of their academic program. This provided a significant opportunity for one of us² to be directly involved in the planning and development of a new campus museum, the only new museum developed on campus in the last 20 years. From the beginning there was recognition that the new museum should not be a static

¹ BOYLAN (1999) tracks the origins of the relationship between objects and academies back to antiquity on the presumption that much of the teachings of early observational inquiry would have been based on collections of specimens.
² Laura Giberson.
representation of past events and achievements. Instead it was envisaged that the museum should be primarily focused on people’s stories rather than objects. As such, it would play a fundamental role in promoting the Sports Association’s aspirations of a healthy lifestyle for students, staff and the local community. It would also support the broader institutional aspirations of stakeholder engagement and community building through sport. This philosophy sets it apart from the vast majority of campus museums. A recent survey of Australian university museums and collections (SIMPSON 2012b) concluded that this is the first university-based museum of sport in Australia.

The university originally commenced with only nine sporting clubs and an annual budget of $12,000, a one room gym and two squash courts. The expansion of facilities in the sports complex included the development of a 50 metre outdoor pool and a 25 m indoor pool. There have now been over 30 sporting clubs or groups associated with the university at various times. These include clubs for Australian football, badminton, basketball, cricket, fencing, golf, gymnastics, hockey, karate, mountaineering, rowing, rugby league, rugby union, skiing, squash, soccer, tennis, cheerleading, ultimate Frisbee and the Macquanuts (a scuba diving club). While this diversity can potentially provide interesting material collections, of more significance is the diversity of shared experiences and stories. Capturing as much of this as possible will be important for the future of the museum. Developing the museum was clearly framed with the recognition that while the concept of a healthy, active and engaged lifestyle is important for all staff and students, it also produces some elite athletes. Their achievements can be seen as important points of connection for the entire university community. The museum also positioned Macquarie University as one that produces elite athletes, with state-of-the art sporting facilities. The museum was well positioned to build awareness with the community, potential students and with athletes that Macquarie University competes at the top level in university sport.

**Sport in the museum**

The subject matter of museums has traditionally focused on art, history or science. A sporting museum is a fairly contemporary notion. There is no Australian university museum model to guide development. As noted above, the initial concept for a hall of fame at Macquarie University came about because the University Sports Association felt that the history of athletics and extent of elite sport at the university was not well showcased to the university community. At the same time there was a clear realisation that, in a university context sport is a significant part of the lives of many staff and students, giving the concept of a hall of fame relevance to the community at Macquarie University. It was also recognized that sport can be a catalyst to engage and build relationships with alumni to encourage long-term donor relationships.

Goulding (2000) suggested that in showcasing traditional subjects such as history and art many museums in fact make visitors feel excluded from the exhibition subject matter. Exhibits can act as barriers to visitors through exhibiting material that has no specific relevance to many individuals. In history museums in particular, it is nearly impossible to infuse relevance by exhibiting every visitor’s unique historical heritage. Sport, however, is important in many peoples’ lives and is appropriate subject matter for a museum to bring people together through a shared experience. It is fitting, therefore, that museums are developed to celebrate sport. Gammon & Ramshaw (2005) argued that sport includes such unique cultural mores, values and traditions that make it appropriate subject matter for the museum environment and compared such rich potential as similar to a history museum capturing the idiosyncrasies of influential historical leaders. Even though the university’s Sports Association has a significant history there was nowhere to centrally aggregate these components. The

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Hall of Fame at Macquarie is a focus that allows the preservation and celebration of the institution’s unique cultural sporting heritage that has been well established for many years. The design of the new Sport and Aquatic Centre left a large empty space in the corridor between the old section of the sports facility and the new addition, leaving an appropriate space for a museum. This space works well as a museum not only logistically, but also symbolically, since the museum acts a bridge from the old section of Macquarie athletics to the contemporary new addition.

Sporting halls of fame are different from the ‘traditional’ museum model in terms of potential audience. They appeal to the sports fan and sporting tourist. The difference between a sports visitor and a regular visitor is the former will expect a sporting hall of fame to reflect sport itself; the museum needs to be fun, interactive, innovative, entertaining and physical. While some institutions such as science centres may also aspire to recreate some of these elements as part of the visitor experience, many museums do not. These expectations deviate from many regular museum visitors. In Kurtzman & Zauhar’s (1999) *The Virtual Sports Tourist*, six criteria were listed that characterize experiences in sporting halls of fame that visitors considered optimal.

The experience must “require the learning of skills, have concrete goals, provide feedback, let the person feel in control, facilitate concentration and involvement, and be distinct from the everyday world” (Kurtzman & Zauhar 1999, 34). With these six criteria in mind, the development of the Hall of Fame at Macquarie University was intended to produce a museum that is colourful, contemporary, an interactive and evolving space that reflects the physical nature of the sports centre itself. It was assumed that the demographic audience for this museum would, at least initially, be people who are actively participating in fitness and sport, as the audience for this hall of fame will likely be drawn from current members of the Sports Association.

Outside of the institutional setting of higher education, sporting halls of fame differ from many typical museums as they are often private museums owned by sport-affiliated businesses or organisations. The Hall of Fame at Macquarie is owned by the Sports Association. While the Association is an independent entity in itself it still falls within the category of a university museum through close affiliation with Macquarie University.

Some sporting museums have a chequered history due to governance and management issues. For example, one such museum, the Australian Football League Hall of Fame, was launched in Melbourne during 2004 (Frost 2005). This private museum was subsequently sold within the year having incurred a debt of two million dollars. A few major strategic errors of judgement included: a marketing campaign targeted only to children, high admission prices and a late launch that was not well-timed with the football season. The Macquarie University Sporting Hall of Fame is marketed to students, staff and families associated with the university community and is free with gym membership. Membership is also available to the local community. No visitation charges are levied from non-members. By developing links with audiences and inviting participation through its relationship with the university parent body, it is intended that the museum will be operationally sustainable and avoid many of the pitfalls associated with sporting museums such as the Australian Football Hall of Fame.

**Developing the museum’s business**

The Sports Association had formed a committee as a working group to steer the development of the museum. At the outset, different business models, based on other museums were considered. The committee decided that the museum would be maintained and managed by the Sports Association’s

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4 Some examples in Australia would also include sport specific museums such as the Australian Tennis Museum, operated by the peak sporting body Tennis Australia, and the Australasian Golfing Museum, part of one of Australia’s oldest golf courses in Bothwell, Tasmania.
staff, and museum studies interns. The museum was not intended to directly earn revenue; however, it
does serve to promote sport at Macquarie University and act as a catalyst to engage with alumni,
students and the community. An opportunity that was pursued early on in the development of the
museum was building relationships with sporting alumni and potential long-term donors, who would be
more liable to support sporting initiatives and programs at the university. When the museum was first
developed, the alumni community had not been strongly engaged or prospected for investing in
university sports.

The committee was driven by the association’s chief executive officer at the time5 who had a clear
vision for the sporting hall of fame. This was an important element in planning and conceptualisation
of the project. It not only demonstrated institutional commitment to the project, but also provided
guidance and quick access to decisions on project components. The committee, however, lacked
anyone with a specific museum-related background or museum training, thus enabling an opportunity
for postgraduate student6 participation in the project during the planning phase. One of the first tasks
of the postgraduate student was the development of a series of policy documents, informed by the
mission and purpose of the museum for presentation to the committee. Another postgraduate student7
worked on a later (2012–2015) phase of strategic planning.

Despite the obvious philosophical orientation to focus on people and stories, the development of any
new museum requires material collections to develop interconnections between people and narratives.
Originally there was little in the way of material items available to the Sports Association. Material that
was available often lacked provenance. The development and approval of a collections policy
provided guidelines for a systematic approach to the development of a material collection.

The Hall of Fame Museum was always intended to foster active interest in athletics and the athletic
history of competition at Macquarie University. The museum wanted to highlight past successes in
athletics to engender a sense of pride and endowment in students as well as generally foster public
interest in the sports and recreation facility as well as athletics at Macquarie University. As in all
museums, the collection management plan and policy was closely aligned with the mission statement
of the museum and guides the curator in collection development. Clear guidelines also enable ongoing
collection development by Sports Association staff without specific museum training. Part of the
strategy involved actively prospecting for artefact acquisitions from specific athletes and alumni. A
targeted calling campaign was conducted through the university’s alumni office to inform potential
donors about the museum and seek objects.

The committee agreed that the Sporting Hall of Fame would concentrate on collecting the following
objects: trophies, sporting equipment, plaques, photographs, sporting uniforms, videos of Macquarie
athletics and books that have relevance to Macquarie athletic history such as the annual reports of
individual sporting clubs. This meant that the museum’s primary subject areas are: Macquarie
athletes, Macquarie competitions and Macquarie alumni who have achieved to elite athletic levels.
Rather than just being a documentation of achievements, of equal importance are social issues such
as women and sport, sport and the media, disability and sport, sport and age, sport and body image,
sport and technology and sport at universities in general. It is believed that these subject areas related
to Macquarie University through individual examples augmented by oral history research will be the
focus of future temporary exhibitions.

5 Deidre Anderson.
6 Laura Giberson.
7 Ashleigh Thomson.
The establishment of policies and processes enabled the expansion of collections. An important part of the development of the collection involved the curator working with a range of sporting clubs to encourage individuals to donate memorabilia, ephemera and other material of relevance in the private hands of previous sporting alumni. The proactive collecting and relationship building that took place early played a key role in engaging clubs, athletes and alumni with the Sports Association and informing them about the museum. The act of active collecting helped to build early audiences and supporters for the Sporting Hall of Fame. This was only possible through the introduction of a coherent set of professional acquisition processes that involved an assessment of the relevance, use and condition of potential collection objects. A full set of operating policies including processes for bequests, deed of gift, accession, deaccession, storage, conservation and loans were also developed.

Once the policy framework was agreed and in place, the next step involved the development of exhibition content. Ensuring positive visitor experiences is central to the success of the venue. The primary aim of the Sporting Hall of Fame is to encourage a sense of stewardship, pride and a history of achievement in the community at Macquarie University. The committee intended that all exhibitions would inspire visitors to reflect and feel part of the achievements of past athletes at Macquarie. In order to accomplish this, visitors of all cultural backgrounds need to have a positive experience when they engage with the exhibition space.

Linn (1983) suggested exhibits need not provide as much information as possible on a subject. Rather, information should encourage visitors to contemplate the subject further, stimulate debate and discussion and lead the visitor to research the subject further independently. As it stands, there has been little research conducted in the field of Macquarie athletics. Therefore, any information, no matter how concise will likely be fresh to visitors to the museum. Complementing Linn’s philosophy, the hall of fame was designed to complement the sports and aquatic centre at Macquarie, making the centre a more comprehensive community centre. The hall of fame is not intended to extensively educate visitors on the history of Macquarie athletics and individual athletes, instead it is intended to serve as a positive space that celebrates past achievements and builds awareness of sport at Macquarie University.

Design and development was driven by the planning committee. This included staff with specific expertise in facilities management, finance and photography. This unique mixture of skills in a university setting with executive leadership produced a dynamic and effective working environment. Elements such as text panels, conservation and preservation standards and display options were not familiar to the committee, and not central elements in the creation of the exhibition space, however, the committee emphasised a few agreed approaches to exhibition design from the outset. Firstly, the need for large, colourful images to be featured in the development of exhibition spaces was seen as an essential element. Textual information needed to be concise and to the point to cognitively orientate the visitor in a simple and direct manner. Basic information such as who is represented in photographs and why that person is significant are a minimum standard throughout. Another important guiding principle for text panels is the ability to easily replace panels when exhibitions are changed. Having permanent text panels in a small exhibition space creates design problems and inflexibility in the future. While visitors need to be cognitively oriented, through a comprehensive organisation of themes and subject areas that are easy to follow, they must also be physically oriented (GOULDING 2000). Directional signage is deployed at key points within the sporting complex.

In terms of evaluating the effectiveness of the hall of fame it must be remembered that the mission of the museum is not to directly educate people, but to showcase the achievements of Macquarie University’s past athletes. With a range of policies, procedures in place the committee were able to

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8 Laura Giberson, and later Ashleigh Thomson.
develop the business of the museum enabling collection documentation and expansion, and exhibition development. The project officer\(^9\) developed three exhibition concepts for consideration as the inaugural exhibition theme for the museum. A further ten forward exhibition concepts were also briefly outlined for the committee to enable it to scope future developments.

The Macquarie University Sporting Hall of Fame was opened by vice-chancellor, Professor Steven Schwartz on 26 March, 2009. The first exhibition entitled *Our Sporting Community* was focused on a selection of high profile sporting participants. This helped to extend connections with previous sporting alumni encouraging donation of more objects to build the museum’s collection. The athletes in the first exhibition had achieved success in swimming, rowing, athletics, softball, ultimate frisbee and wheelchair basketball. A rowing coach was also featured. The launch was attended by friends and family of those featured in the exhibition. One of the technical highlights of the museum was the development of a ceiling projector showing video footage which gives visitors a feeling of immersion in the subject. The focus on individual stories reinforces the importance of people in the work of the museum.

The first exhibition was followed by *Origins of Our Sporting Heritage* an exhibition providing insight into the foundations and history of the sporting clubs from the period 1967–1977. It chronicled great events during the university’s past and focused on eighteen clubs established during this time. There was also a focus on individual competitions and victories. Personal accounts from individuals and teams were also included similar to the methodological approach adopted in the first exhibition. The third exhibition entitled *Our Sporting Evolution* was launched in late 2011 focusing on the evolution and growth of the Macquarie University sport clubs from 1978–1988.

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\(^9\) Laura Giberson.
In late 2012 *Macquarie at the Olympics* was opened. This exhibition celebrated the achievements of Macquarie University athletes who have competed at the Olympic Games. The museum identified strong university links to the Olympic and Paralympic Games dating back to Montreal in 1976. Seventeen Olympians, including staff, alumni and students have competed. The exhibition was created to celebrate an Olympic year. It also recognised that Macquarie Olympians have embraced the broad Olympic spirit of goodwill, unity, reconciliation and peace in their pursuit of sporting excellence that has captured the public's imagination. The exhibition featured a display cabinet with each athlete's special Olympic memorabilia.\(^{10}\) This topic was one of the forward exhibition concepts presented to the committee in 2008, during the Beijing Olympics, before the launch of the museum.

A series of other exhibition concepts were also presented to the committee prior to the launch of the museum. They include diverse subject matter such as individual achievements, individual club history, sport and health, sport and nutrition, cross cultural perspectives on sport and gender issues in sport and sports promotion. There is extensive scope for future exhibition work.

**Concluding remarks**

The development of the new sports and aquatic centre not only included state of the art facilities but was designed to incorporate a sense of community. The facility has attempted to promote healthy living, fitness, nutrition and community. The Hall of Fame Museum celebrates the history and athletic achievements of Macquarie University as a positive facilitator of the Sports Association's mission in support of the broad Macquarie University community.

The work of the Sporting Hall of Fame Museum at Macquarie University has been informed by a philosophy of purposeful community development to build institutional identity. While much has written about the purposeful work of mainstream museums (e.g. *Sandell* 1998), a similar philosophical orientation is rarely applied to the development of university museums, with some rare exceptions in more generalised terms (e.g. *Burman* 2006), because of their traditional origin and purpose of supporting the delivery of discipline-specific academic instruction.

For this reason we propose that the Macquarie University Sporting Hall of Fame Museum represents a distinct type of
university museum, perhaps best characterised as a ‘Museum of Institutional Identity’. A review of the
literature on university museums reveals that while identity and institutional purposes have previously
been invoked as one of the contributing value adding roles undertaken by university museums, these
are usually construed as secondary outcomes rather than as cornerstones of their original foundation.

It is common to ascribe purpose in terms of the preservation of institutional heritage and history,
particularly in European universities.¹¹ For example, Heinaemies (2008) describes this function as a
responsibility with the emphasis on preserving what exists rather than extending what is possible. This
form of institutional prerogative is more a memorialisation than a constructivist paradigm. Some new
university museum developments focus on preservation as the establishment paradigm (e.g. MENEZES
DE CARVALHO 2012). Other discussions of purpose in the literature tend to focus on the tensions
between serving different audiences (e.g. BIANCO 2009) rather than a focus on building new
audiences. Purpose is more readily reflected in the work of university museums through more specific
narratives such as communicating scientific values and heritage (SOUBIRAN 2006).

A key aspect of the development of Macquarie University’s Sporting Hall of Fame was that members
of the committee had travelled the world to observe international universities and learn how they
worked to advance sport, especially elite sport. This experience, paired with the personal experiences
of committee members, working overseas in sporting facilities and for elite sports programs, helped
envision and develop the Sporting Hall of Fame. The diverse mix of cultural backgrounds and
experiences of participating individuals resulted in a committee open to new ideas, innovative design
concepts and an eagerness to experiment with the concept of a Sporting Hall of Fame. Like many
universities Macquarie has strong international connections through global academic and professional
exchange. Committee participants were able to incorporate this international perspective to refine the
concept of developing a new innovative museum.

Institutional identity is more commonly construed with art museums and art collections. Yet sport, also
an integral and unifying conceptual framework of the human condition is rarely linked to the values
and aspirations of a higher education institution. The development of the Macquarie University
Sporting Hall of Fame Museum can be construed as an innovative new way of building higher
education identity through museum work in an increasingly competitive knowledge-based industry.

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¹¹ This was a primary motivation for the formation of Universeum, a network of European university museums dedicated to the
preservation academic heritage and the promotion of European academic traditions.


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From the geophysical-meteorological Observatory of Modena to the Italian network of observatories

ELENA CORRADINI

Abstract
The paper reconstructs the history of the Observatory of the University of Modena. The second part describes a network of Italian astronomical observatories, starting from creating a database of the collections by cataloguing the historical instruments through the standard cataloguing pattern for scientific and technological heritage released by the Central Institute for Cataloguing and Documentation within the General Informative System for Cataloguing SIGEC Web. The main goal is to spread knowledge about the collections of scientific instruments through an effective cultural and educational action, using in particular the updating of the website, digital technologies and social networks.

The history of the geophysical-meteorological Observatory of Modena
The creation of the observatory and the direction of Giuseppe Bianchi
A renewed interest for astronomical studies in Modena is due to Maximilian of Austria Este, brother of the archduke of Modena and Reggio Emilia Francesco IV. After the restoration Modena became the capital city of the Este Dukedom again. In 1814 the archduke Maximilian contacted the young Modenese Giuseppe Bianchi who had graduated in mathematics the previous year (LUGLI 2007). After a brief interview with Maximilian, he was awarded with a ducal bursary in order to let him move to Milan and improve his astronomical studies in Brera under the guidance of the astronomers Barnaba Oriani, Giovanni Angelo Cesaris and Francesco Carlini. His stay in Milan allowed him to continue his studies and to keep in contact with the archduke Maximilian – who was particularly interested in the studies of astronomy and often was in Milan – as well as with important scholars, such as the mathematician Gabrio Piola with whom he had a constant though irregular correspondence from 1817 to 1850.

In 1818, at the end of his studies, Bianchi was called back to Modena and awarded with the teaching of theoretical astronomy, created on purpose for him. At first he did not have any instrument or observatory to practice his science. Yet, in the month of January of the same year, when he still was in Milan, Bianchi had sent to Marquis Luigi Rangoni, Studies Magistrate and Minister of Public Education, a list of instruments to be bought. In the following month of March Rangoni announced him that his request had been approved by the archduke Francesco IV. Therefore Bianchi commissioned in Munich a Meridian Circle by Reichenbach: this arrived in Modena in the middle of July 1823.

At the end of January 1818 Rangoni, as suggested by Bianchi, wrote to the rector of the university, the mathematician Paolo Ruffini (BIANCHI 1894), asking him not only to ask Amici (DONATI 1865; PALERMO 1870; ABETTI 1960; DI PIETRO 1898; DI PIETRO 1994; MESCHIARI 2001) to give the Newtonian reflecting telescope that he had already built in 1811, but also to sign a contract for the construction, in the following six years, of the other two instruments: a transit instrument for right ascension and an equatorial telescope for extra-meridian observations.

Amici accepted the proposal: he gave to Bianchi the Newtonian telescope on 9th June 1820 and wrote to the rector saying he would construct the two instruments over the six-year contract with the help of the technician Giuseppe Sgarbi. He added that he did not want any interference or supervising conditions: Bianchi should only provide information about the technical requirements. Amici started construction in September 1821.
The issue of finding an adequate seat for the observatory still remained: as the palace of the university, built by Francesco III from 1774 to 1776, did not have any appropriate room, and as the termination of the six-year contract of Amici approached, it became more and more urgent to find an appropriate place to house the new instruments (Mor & Di Pietro 1975). The problem was solved by his successor, the archduke Francesco IV, when on 15th January 1826 he allowed the instruments to be placed in the eastern tower (on the right side of the façade) of his own ducal palace. This had been built in the first half of XVIIth century, as in 1598 Modena became the capital of the Estense Dukedom (Corradini 1999) (fig. 1).

The tower, chosen for the new observatory, had already served Bianchi as place for astronomical observations from 1819 to 1826, and in particular to observe the longitude signals lit up on the Cimone mountain and on the Baldo mountain in May 1822 and August 1823. During the creation of the observatory, Bianchi dedicated himself to observations and to various researches.

The works for the observatory began during the spring of the same year 1826 under the direction of Gusmano Soli, inspector of the royal buildings, and lasted until the end of August of 1827.

It was necessary to transform completely the internal structure of the upper part of the tower, thirty meters high from the ground, making the rooms suitable for the new usage, without changing anything in the external shape, architecturally symmetrical with the other parts of the ducal palace. It was necessary to rebuild the whole roof of the tower, since it had to be divided obliquely by the meridian clefts (since the front of the palace is facing south-west), in correspondence with the Meridian Circle and the transit instrument that were placed on the second floor of the tower (where they still are). On the first floor there was a big office or study and two smaller rooms (Bianchi 1828). In order to ensure the necessary steadiness to the framework of the observatory, it was necessary to set a huge pointed arch vault on the two external walls of the eastern and western side, linked with chains, to create within the tower a support for the three fundamental instruments (fig. 2): on the buttress walls, over the vault, Reichenbach's Meridian Circle was placed on one side; on the other, the transit instrument (fig.
3), and on the top of the arch the pillar of the equatorial telescope was placed (BIANCHI 1846; MESCHIARI 2003a; LOMBROSO & QUATTROCCHI 2008).

In the summer of 1827 other instruments were placed in the observatory (MESCHIARI 2003b): a Newtonian telescope of Amici, a repeating reflecting circle by Gambey, and a Dollond telescope, left to the heirs of abbot Venturi (on which Amici stuck an excellent double image micrometer), a Grindel pendulum-clock, and the Fraunhofer telescope (BUFFA & FILIPPINI-LERA BUFFA 1988; DI PIETRO, LUPPI & MANZINI 2011).

Next to the observatory a laboratory was created containing necessary tools – machines for glass and lens working. Giuseppe Sgarbi, an excellent craftsman who had been working until that moment in the laboratory of Amici, was appointed technician.

The first official observation began on 17th October 1827 as stated by Bianchi in his Acts of the R. Astronomical Observatory of Modena which were published from 1834 on (BIANCHI 1834).

There was no recorded opening ceremony celebrating the birth of the new observatory although the newspaper Il Messaggiere Modenese on 7th November 1827, n. 89, reported the realization of the observatory promoted by Francesco IV in the right-wing tower of his ducal palace, mentioning its instruments and the fact that Bianchi had already started his recordings. The following year Bianchi stated himself this information in the Astronomical Ephemeris of Milan (BIANCHI 1828).

It is very important to notice that Bianchi started the daily recordings on dedicated registers, which are still preserved in the observatory, of the observations on meteors (rain, snow), the temperature (originally measured with old temperature scales, but after a few years in degrees Celsius), the atmospheric pressure, wind and then solar radiation.

The approval of archduke Francesco IV for the observatory was proven by the fact that he not only supplied the observatory with the instruments and the books, but also he considered it as a status symbol like the Gallery of Pictures and the Library, and the observatory was included with them in the visiting tours of his Palace for Princes or Sovereigns that he hosted in Modena (BIANCHI 1846; TABARRONI 1988; VENTURI BARBOLINI 1997).

The Observatory of Modena was built in the same year of the one founded in Rome, at the Campidoglio, by Feliciano Scarpellini. The observatory was preceded by the older ones of Bologna (1725), Parma (1759), Milan (1763), Padua (1767), Rome Collegio Romano (1776), Palermo (1790), Turin (1791) and Neaples Capodimonte (1820); it was then welcomed with the approval and good wishes of all astronomy scholars, both Italian and foreigners, as shown in the letters of Bianchi of that time which are preserved at the Estense Library in Modena.

The Cabinet of Metrology and the Metric Workshop 1851
In the middle of XIXth century, there was the Metric Workshop or Cabinet of Metrology in the rooms next to those of the observatory.
The law of 27th October 1803 introduced the metric system in Italy. But after the fall of Napoleon I, once the ancient government had been replaced, old measures were readmitted. In 1846 in Piedmont the idea to adopt the French metrical system was suggested and some standards were ordered in Paris. In Modena, under the reign of archduke Francesco V, son and successor of Francesco IV, a ducal decree issued on 17th October 1849 stated that starting from 1852 the Este Dukedom would introduce the decimal metric system to make the measures uniform instead of differing from place to place; there was also to be a new regulation for the checking measures (CHISTONI 1893; LODOVISI 1997; LODOVISI 2003).

A chirograph issued on 27th October 1849 by Francesco V appointed a special commission on weights and measures headed by Stefano Marianini, president of the Italian Society of Sciences in Modena (BIANCHI 1855). Since the month of August it had been suggested to the Minister of Finances Ferdinando Castellani Tarabini to ask Giuseppe Bianchi to go to Paris to investigate and measure the new archetypes that had been commissioned there. In Paris Marianini and Bianchi got in contact with Jean Baptiste Biot, a member of the Italian Society of Sciences, who asked for the assistance of Henri-Victor Regnault, physician and teacher at the College of France and a great connoisseur of the instruments and techniques in the metrological field. They commissioned a standard kilogram and a precision balance, which was made by Joseph Deleuil; a standard meter, a linear measures comparator and a dividing machine which were made by Guillaume Perreaux.

Between the beginning of August and the middle of September 1850, after Deleuil and Perreaux had accomplished their task, Bianchi stayed in Paris to perform a series of tests with the new instruments, comparing the archetypes created for the Dukedom of Modena with those preserved at the Internal Ministry of France and at the Astronomical Observatory of Paris. Once the instruments arrived in Modena at the beginning of December 1850 (LUGLI 2007), Bianchi announced in a letter to Biot sent on 31st January 1851 the starting of activities in the Cabinet of Metrology (BIANCHI 1851; GROSSI 1997; APPARUTI 2003).

Thanks to Bianchi, Cesare Zoboli, who worked in the mechanical laboratory of the Astronomical Observatory, was asked by the duke to supervise the handling of archetypes and instruments from Paris. The difficulties in introducing the decimal metric system in the Estense Dukedom were expressed in a decree of the Ministry of Finance issued on 29th December 1855 which delayed the enforcement of the decimal metric system for private administrations. The ministry then assumed the task to produce a series of standard instruments in order to let local communities adopt them as soon as possible. In the meantime, Zoboli went to Genova, Turin, Milan, Lecco and other places of Northern Italy to get the necessary instruments and raw materials to start production. From 1st January 1856 the task of supervising the production activities for the creation of the seventy-two standard instruments for new measures for each of the 72 local administrations of the Estense Dukedom was assigned to Zoboli. The Metric Workshop started its activity at the beginning of June 1856 in some rooms in Largo Hannover.

**Pietro Tacchini's direction**

The archduke Francesco V in 1859 was removed from Modena after the Italian unification, Bianchi lost his position as director of the observatory and was replaced by the Modenese Pietro Tacchini (LUGLI 2005). He had been Bianchi's assistant and thanks to his interest he obtained in 1857 a bursary to attend the University of Padua for the academic year 1858–59 where he studied astronomy under Giovanni Santini and Virgilio Trettenero. It was a good start for his career as astronomer.

Thanks to the advice of Giovanni Virginio Schiaparelli, Tacchini moved to Palermo, where there were better instruments for his studies. He was interestingly succeeded by Domenico Ragona, the previous
director of the Observatory of Palermo. Tacchini, during his stay in Sicily, promoted the construction of the observatories in Catania and on Etna mountain. Years later, as Tacchini became director of the Central Office for Meteorology in Rome and promoted the meteorological movement in Italy (TACCHINI 1902), he was strongly supported by the Observatory of Modena which was ready to take part in the wide network he designed and implemented: therefore Tacchini always had close relationships with Modena (RAGONA 1875; TACCHINI 1882). Furthermore Tacchini started to create the Italian magnetic map and entrusted Ciro Chistoni, professor of physics, with the first measurements.

*The meteorological observatory under the direction of Domenico Ragona*

In October 1863, when Tacchini moved to Palermo together with Gaetano Cacciatore, the direction of the Observatory of Modena was assigned to Domenico Ragona who had been director of the Observatory of Palermo from 1853 to 1860. Before getting the direction of the Observatory of Modena, Ragona had been sent by the general lieutenant of Sicily to study Astronomy abroad and he stayed for long time in Berlin with Johann Franz Encke, then in Bonn with Friedrich Wilhelm August Argelander, and on the way back he went to the most important European cities to visit their observatories and the workshops of astronomical machines.

In 1866, because of the growing importance of meteorological studies abroad, the Italian government decided to entrust Giovanni Cantoni, Professor of physics at the University of Pavia, with the task to build meteorological observatories. Therefore Ragona understood the opportunity to transform the Observatory of Modena as one of these new institutions.

Meteorology was not a new science to Ragona: he already studied it when he was director of the Observatory of Palermo.

Once he was convinced that the best interests of the observatory would be to change its research emphasis, the first task of Ragona was to find the best meteorological instruments available. He could count on the experience he had in Palermo: he had the advice of Cantoni, who was the official scientific consultant of the first official meteorological service founded in Italy in 1865 thanks to the initiative of the Ministry of Agriculture (direction of statistics). As the instruments provided by the government were scarce, he obtained some new ones from the province, which clearly understood the utility of meteorological studies and supported the Ragona’s initiatives (RAGONA 1865; RAGONA 1891).

He introduced right away the regular and methodic use of psychrometer (1864) and obtained a standard Salleron barometer for the study of wind. In 1865 he invented and constructed an hourly pluviometer and built the first meteorological window (fig. 4). These improvements allowed thermometric measures that, until that moment, were performed on the terrace without any shield and in a rough manner by placing the thermometers in the clefts of the passages (RAGONA 1871a).
Angelo Secchi clearly showed in Rome through his meteorograph the advantages of a constant registration of meteors. Ragona supplied the observatory with recording machines, some of them, including an anemometer, were built by him or by his technician. The observatory was also supplied with the first recorders: the two most important instruments were the hourly pluviometer (1876) and the evaporimeter (1870 ca), unique tools because of their precision and cleverness (RAGONA 1871b).

In 1876 the observatory was officially termed meteorological, according to the decree n. 3037 of the Italian King Vittorio Emanuele II (published in the Official Journal of the Italian Kingdom on 11th April 1876 n. 85), stating that the observatories could belong to three different categories (art. 1–2): “The first one concerns those aimed in particular at the study of practical Astronomy and at the progress of science”, namely the observatories of Neaples, Milan, Florence and Palermo; “The second category concerns those linked to the faculties of mathematical, physical and natural sciences within the Universities, where there is also the mathematics section of the educational faculties”, namely the observatories of Padua, Bologna, Rome (Campidoglio) and Turin; “To the third category belong the observatories of Modena and Parma”. Concerning the observatories of Modena and Parma, the decree stated (art. 3) that “these ones are named Meteorological Observatories, and belong to that group of institutes of observation used by the Ministry of Public Education, Agriculture, Industry and Trade, Public Works and Navy to verify and to coordinate meteorological phenomena”.

In 1876 Ragona suggested the creation of an Italian Meteorological Society, which would publish the Bulletin of meteorological research and records transmitted by the associate members, and to report on the progress of these specific studies abroad.

Once the society had been created, with Ragona as president, he founded the Yearbook of the Italian Meteorological Society, published twice a month in 1878 and 1879 by Loescher in Turin in 16-pages. Then this Yearbook ceased publication because in 1880 the Yearbooks of Meteorology were founded by the Central Office in Rome, and also because of the creation of the “Italian Meteorological Association” whose members left the society created by Ragona to join the new one (RAGONA 1887).

The meteorological and geophysical observatory under the direction of Ciro Chistoni and Carlo Bonacini

In 1892 Ragona died and Ciro Chistoni, professor of physics since 1887, became director of the observatory.

Chistoni started his career in 1877 in Pavia as the assistant of Giovanni Cantoni, who gave a strong impulse to meteorological studies in Italy; the first studies accomplished by Chistoni in that period concerned hygrometry, a topic that he continued to research later. In 1879 Chistoni, chosen by Tacchini as assistant of physics for the new Central Office of Meteorology in Rome, was sent abroad to visit the most important geophysical observatories and to learn the practice of magnetic measures. At the end on 1881 he came back and started right away a campaign to design the general magnetic map of Italy, according to Tacchini’s program; while doing that job, he found ways to deal with many meteorological issues, as stated in his writings prior to his arrival in Modena. During his first years in Modena, he proved his competence with new studies in the field of magnetology and made new contributions to the magnetic map of Italy, in which he was well succeeded by Luigi Palazzo (PALAZZO, PLATANIA, AMERIO, PACINI, BONACINI, SIGNORE & MALLANDRA 1927).

Thanks to the extraordinary contributions of the ministry, Chistoni could repair and refurbish some rooms, improving the equipment. He started observations with the eliofanograph, and renewed the meteorological balcony according to the suggestion of Pietro Tacchini, director of the Central Institute of Meteorology in Rome. He also built a meteorological roof in the public garden which had a snow gauge to measure the amount of snow. He accurately corrected the altimetrical quotes of the
observatory; started in 1895 a systematic and rigorous series of *Publications of the Observatory*, established exchanges with other national and international institutes, enriched the library with new acquisitions, suggested changes of personnel to widen research interests and changed the name to Geophysical Observatory (1897) to show that the institute had enlarged its field of action.

In 1896 an astronomical dome in copper was built on the top of the Observatory tower. This has been recently rebuilt thanks to the financial contribution of the Province of Modena with provision for museum premises with the co-financing of the University of Modena and Reggio Emilia.

Between 1891 and 1898 Chistoni, thanks to the collaboration of Giacomo De Vecchi, started and concluded a long experimental study on permanent magnets; his research can be found in the publications of the observatory (CADOPPI 1988; LUGLI 2002; BRENNI 2010).

In 1906, when Chistoni was awarded with the direction of the Institute of Terrestrial Physics at the University of Naples, the directorship of the Geophysical Observatory was entrusted temporarily to Dante Pantanelli, and starting from November of the same year the Faculty of Sciences named Carlo Bonacini as director (LUGLI 2006). Although in 1909, because of the activity of the observatory was reduced under restrictive instructions, Bonacini maintained a good level of scientific activities (LUGLI 2006). In 1927, Bonacini promoted the celebrations for the first centenary of the foundation of the observatory (BONACINI 1928).

Starting from last century the observatory is part of the udometric national network. Meteorological observations are daily performed with precision, with the use of automatic equipment. Meteorological observations are also performed on other sites, mainly located in the Apennines of Modena as Sestola, Pavullo and Cimone Mountain.

The daily meteorological time series, carefully observed at the observatory, which continue to be recorded in the registers, are a good basis to highlight any changes in climate. Time series of temperature, pressure, rainfall and snow have been analyzed with particular attention: they allow the drawing of statistical models over long periods of continuous observations. The time series of daily minimum temperatures have clearly shown a steady increase over time, due to the urbanization of the city and global climate change (TAROZZI 1983; TABARRONI 1985; FRONTERO, LOMBROSO & PUGNAGHI 1988; MORELLI 1988; TAROZZI 1988; TAROZZI 1989).

**A project for a network of Italian historical observatories**

The creation of the first national network of Italian historical observatories will develop incisive popularization, and promote a stronger general coordination of the activities and cultural exchanges among different structures that operate within the diffusion of scientific culture. This will allow the cultural activities to reach a wider audience, such as multi-regional or national and address different issues in a multidisciplinary way with respect of specific competences of each single structure and/or operational area.

The mission of the network is to activate tools to make the interaction of users with science possible, amusing, exciting and versatile to stimulate their curiosity, and interest. To respond to this need, scientific museology is in constant evolution, and aware that if audiences lost interest in science and not understand its importance, it would be difficult for scientists and researchers to obtain adequate financial support.

**Monitoring the historical instruments**

An introductory objective for the network is a systematic survey – through a bibliographic, archival and iconographic research – of the historical specimens and objects that constitute the different scientific
collections of the observatories which are open and accessible to a wide public, or planned to be displayed. This survey is the best way to start to describe and interpret the research activities of the observatories, but also to activate procedures to safeguard them in collaboration with regional and local offices of the Italian Ministry of Cultural Heritage and Activities.

The network promotes collaboration among institutions and increases knowledge, both in quantitative and identifiable terms, of historical instruments. In order to achieve this, it will be necessary to survey the existing databases of historical instruments of observatories, finally end to update and complete them and start computer cataloguing campaigns for those historical instruments that have never been catalogued.

The need for systematic cataloguing, to preserve, safeguard and valorise cultural heritage, is an established idea not only in the cultural world but also among public opinion. Cataloguing cultural heritage basically consists in recognizing and defining the instruments in time, space and during history. A catalogue promotes the recognition of the context within which the different evidences of civilization have been created over time.

The registration, description and classification of the scientific heritage according to standards released in Italy at national level by the Central Institute for Cataloguing and Documentation of the Italian Ministry of Cultural Heritage and Activities is fundamental. Moreover, databases will be useful not only to spread information on cultural heritage but also to correctly preserve cultural heritage as defined by the Code for Cultural Heritage and Landscape. This goal can be achieved through the following: first of all their “study and knowledge”, consequently an “attentive and constant maintenance” and, if necessary “a well performed restoration”.

In order to catalogue the scientific technical heritage the Central Institute for Cataloguing and Documentation has created a specific pattern, the Scientific and Technological Heritage – PST pattern, conceived – like the patterns realized for the different kinds of cultural goods – as a hierarchical structure that allows each instrument to be described and related to its typological or phenomenological specific relationships, as well as to the historical dimension of the context. This pattern for the scientific technical heritage has to be used within the General Informative System for Cataloguing on the web, SIGEC Web, managed by the same Central Institute for Cataloguing and Documentation.

The PST catalogue pattern is the result of a collaboration between the Conference of Italian University Rectors (CRUI), the Italian Ministry for Cultural Heritage and Activities and the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). Its development is due to a working group constituted by the representatives of the University of Siena (CUTVAP, University Services Center for the Safeguard and Valorisation of Ancient Siena Scientific Cultural Heritage), the Scienza e Tecnica Foundation of Florence and the Central Institute for Cataloguing and Documentation. The origin of the catalogue pattern refers to the pattern for objects of art named OA, and takes its name from the SIC Scientific Instruments Commission: thanks to the collaboration of specialists and researchers of scientific heritage, a specific catalogue pattern for scientific instruments STS has been implemented. This one has further been developed to become the present pattern PST – Scientific and Technological Heritage.

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2 D. l. 42/2004, art. 29.
The cataloguing of the collections of ancient instruments of the observatories taking part to the network will be in collaboration with the postgraduate master course in *Cataloguing and accessibility of cultural heritage: new technologies for the valorisation.*\(^5\)

**The network’s activities**

This network will boost the flow of information and data among the different research structures, in order to promote the cultural exchange in a multidisciplinary approach and for the internationalization of scientific knowledge. Data collected and digitized will be a dynamic reality, constantly growing and updatable thanks to the contribution of the whole scientific community and to the collaboration of CRUI – Conference of Italian University Rectors – Museum Commission, which will be a reference point for the whole network and to which the network could work as operating partner.

Through the network it will be possible to promote initiatives for the diffusion of scientific information and culture, and to produce multimedia open source material and cultural initiatives thus strengthening the network and enriching it with content to boost its effective communication. Moreover, meetings, seminars, temporary exhibitions, informative flyers and other multimedia products will be the means to give visibility to the network activities (DUFF, CARTER, DALLAS, HOWARTH, ROSS, SHEFFIELD & TILSON 2010).

Advanced multimedia tools and technologies will allow to create cultural communication programs that involve the emotional and sensorial spheres, by adopting edutainment strategies specifically designed for students of different kinds and levels of schools – including university students –, for scholars and professionals, as well as general audiences, stimulating the visitor through sight, hearing, touch and smell, and 3D reconstructions will create virtual visiting paths using various narrative registers (ALEXANDER & LEVINE 2008; GOSPER, MALFROY, MCKENZIE & RANKINE 2011). In particular for the representation of scientific cultural heritage, the network will take advantage of the evolution of multimedia and wireless communication systems, spatial georeference systems and the use of interactive tools, virtual guides, augmented reality presentations, 3D reconstructions, intelligent environment, multimedia paths. These tools will be used on-site also thanks to mobile devices, as well as inserted – according to their specific features – in the web sites of the observatories taking part in the network (BRAND, KINASH, MATHEW & KORDYBAN 2011; DALGARNO, LEE, CARLSON, GREGORY & TYNAN 2011; GARRETT & McMAHON 2011).

One of the aims of the network is the creation of simple to use, efficient and low-cost technological solutions (with specific reference to the Code of Cultural Heritage and Landscape and to regulations and guidelines concerning public administrations, in particular the recommendation of the Web Content Accessibility Guidelines WCAG 2.0).

The availability of multimedia interactive information concerning cultural historic scientific heritage represented by several specimens, objects and tools of the historical observatories will allow the organization of initiatives to promote communication with the world of research in schools of different kinds and levels.

A particular effort will be dedicated to design and build real and virtual educational activities to be enjoyed either within the school or in the observatory – in close connection to its scientific research domains – in a complementary way, to stimulate interest in participating in technical and scientific cultural heritage. These activities will be in collaboration with and addressed to students and teachers, with the support of regional and provincial school offices, headmasters, and associations of teachers.

There is a more general goal of a growth of a clear awareness about the importance of science for everyday life and for a sustainable development of society.

The historical observatories involved in the project can also create and test some informal learning activities for adult audiences composed by those who actively take part in educational activities, oriented to scientific cultural heritage with their personal experience and knowledge (McLOUGHLIN 2011). This will strengthen the activities aimed to social inclusion that have already been started by single museums, with specific attention to migrants and ‘new citizens’ that bear cultural values and knowledge of various origin, by activating inclusion-aimed projects together with their associations and communities (JOHN & JENKINS 2011). Assistance will be provided by the LEM project – The Learning Museum Network Project. This network will allow the historical observatories to provide cultural tourism operators with a useful working tool and a support to guided tours, and to create paths of touristic and cultural interest.

In order to promote the dialogue between historical observatories and present society, and to permit to anybody who is interested in a topic to discuss and share experiences with other people, the use of Internet and of social tools typical of Web 2.0 allows the creation of virtual places without space and time limits (AHRENS 2011; FLAGG & AYLING 2011). The emerging multichannel model will be adopted, and the web will work as conductor: through distributed networks, and in particular social networks (CORRADINI 2012), this model connects not only cultural institutes to their users, but also to other persons. This will be an innovation for the Italian historical observatories which, like the majority of Italian university museums, use an information distribution model typical of Web 1.0, that is to say the broadcast model in which contents are created by the cultural institutions and then distributed to users through the web in a unidirectional way.

The network creation has been envisaged within a research project, thanks to a framework agreement among the university museums of twelve of the most important Italian universities (Bari, Cagliari, Chieti, Ferrara, Florence, Parma, Perugia, Rome “La Sapienza”, Salento – Lecce, Siena, Tuscia – Viterbo coordinated by the University of Modena and Reggio Emilia). The proposal is under evaluation by the Italian Ministry for Education, University and Research for a grant under the directorial decree n. 369 on 26th June 2012 on the basis of the Law n. 6 of 10th January 2000 for the diffusion of scientific culture.

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Museum literacy that is virtually engaging

ANDREW SIMPSON, GINA HAMMOND & JAYE MCKENZIE-CLARK

Abstract
Objects have underpinned pedagogic strategies in the arts and sciences. While recent online units of study enable isolated students to experience higher education, they are usually unable to examine collections. A 3D laser scanning project at Macquarie University creating a ‘virtual museum’ will enable distance students to experiment with curatorial approaches by working with virtual objects in virtual spaces. There are also opportunities for cross-disciplinary experimentation through the juxtaposition of objects from different museum collections. This will help students develop a new form of museum literacy appropriate to the hyper-connected learning laboratories of the future in higher education.

Collections and pedagogy
Engaging with objects, either directly or through digital media, has long been recognised as a viable constructivist pedagogy capable of providing significant meaning and context (HOOPER-GREENHILL 2007). Object-based learning in higher education has been a source of much recent research (e.g. CHATERJEE 2010; MARIE 2010). It is well documented that the main purpose for the development of many university museums and collections was to support discipline-specific academic instruction (SIMPSON 2012).

In recent decades significant advances in digital technologies have spurred many museums to establish an online presence, often including access to individual collection items. The motivation to do this has been to provide better access. A digital presence for collections obviously gives significant exposure to a web audience that are unlikely to be traditional museum visitors. Arguments in favour of digital engagement for mainstream museums have therefore been understood in terms of audience development. The growth of new digital audiences may or may not convert into new physical audiences.

Digital audiences however can have very specialised needs. For example, access to online collections can provide invaluable information to researchers, but critical information may or may not be represented in a digital format or individual items may be difficult to locate or may not be represented online. Accessibility to data can also depend on sites that aggregate significant quantities of metadata for those with specific needs in sourcing online information or representation of objects and specimens. The effectiveness of these sites depend on the comprehensiveness of standardised cross-sectoral metadata protocols, and there is always debate about the efficacy and comprehensiveness of such systems.¹

Some authors have argued that museums and university museums in particular, have been slow to take up the immense challenge and opportunities provided by the expanding digital horizon. CARNALL (2009) outlined a number of circumstances to explain this including (a) the high cost of employing web literate personnel in the early 1990s, (b) museum curators resistant to change and (c) a fear that increased digital access would reduce the number of physical visitors. For university museums, can be added (d), the low priorities museums and collections receive for funding for digital developments from university administrators in comparison with other sections of the academy.

¹ An Australian site is the Museums Metadata Exchange that aggregates collection level data from across Australia, see: museumex.org. At the time of reviewing this site for this paper (December 2012) there was only information from four Australian university museums incorporated into the database.
Despite the fickle nature of financial support, university museums have tried to digitally represent their collections and many individual projects based on specialised collections have been documented. Given that many university museums and collections originated to support object-based pedagogies, it is not surprising that many of the recent developments in what MASSE & MASSE (2009) refer to as ‘cybermuseology’ are oriented towards support for teaching.

MASSE & MASSE (2009) noted that the enthusiasm for cybermuseology was driven by the cheapness of digital storage space in comparison with the cost of physical storage space. While this may be something of an oversimplification, the main point of their paper was the elaboration of wiki style web 2.0 tools that allowed collaborative online teaching and research focussed on collection data. Wake Forest University’s anthropology collection of over 28,000 objects (WHITTINGTON & AL. 2010) were made freely accessible online and museum staff offered stipends to other educational organisations at different levels to incorporate their material into teaching programs. They reported that apart from anthropology, the database was also incorporated into the delivery of university programs in acting, education, history, religion and Spanish. This is an excellent illustration of the cross-disciplinary value of object based pedagogies in either real or physical form.

The Wake Forest University example only included two-dimensional images of objects. Expanding digital capacity now allows for three-dimensional representation of digital surrogates of physical objects. Three-dimensional objects are particularly useful in taxonomy where type specimens can be examined by scientists all over the world without having to leave their computer. But the quality of three-dimensional digital representation is dependent on the density of information that can be captured and stored. More detailed data will allow the development of a more comprehensive and therefore more useful digital image, but dense data sets chew up capacity and can become unwieldy, so a balance between detail and capacity must be struck. This in itself is a moveable target with the increasing capacity for systems to handle progressively larger volumes of data.

One of the few university museums that has experimented with three-dimensional digital surrogates and reported on the results is the Petrie Museum at the University College London (NELSON & MACDONALD 2012). The Petrie Museum’s three-dimensional imaging of collection objects was done in conjunction with their Department of Civil, Environmental and Geomatic Engineering in a 3D scanning initiative that covered a number of different disciplines. They (NELSON & MACDONALD 2012) report that while the scanning technology allowed the capture of data rich material, the development of end user applications, particularly web-based applications, within feasible costs and at an appropriate scale was far more challenging. They also noted that the production and availability of 3D images of Petrie Museum collection objects was not seen as a replacement for engagement with the real object as far as most of the museum’s audience was concerned. While Nelson and MacDonald (2012) did not specifically discuss the pedagogic potential of 3D digital surrogates, they did conclude that improvements in technical capabilities would inevitably lead to a far greater uptake by a variety of different audiences.

Recent research from a Learning and Teaching Priority project at Macquarie University (SIMPSON & HAMMOND 2012) investigated the retention of didactic information through comparative engagement, comparing responses to (a) physical objects and (b) two two-dimensional images per object under controlled conditions. This research showed increased retention of information among students exposed to the physical objects in comparison with students exposed to two-dimensional images of the same objects. To explore the effectiveness of online educational engagement of objects it is necessary to repeat a similar experiment in which students are exposed to original objects and three-dimensional digital surrogates. This is a complex issue allied with a range of visual, object and other
literacies associated with the new learning pathways experienced by digital natives, or millennial learners, that some authors consider may be significantly different from that of previous generations.

Despite the fact that the research is yet to be done on teaching with three-dimensional digital surrogates, now is a good time to experiment with their usage – to promote further significance of the teaching value of university museums and collections. Other developments such as the recent phenomena of Massive Open Online Courses (MOOCs), that represent an industrial scale educational opportunity and, according to some, challenge the traditional business models of higher education, also pose challenges and opportunities for university museums and collections.

While the research into retention of didactic information (SIMPSON & HAMMOND 2012) indicated better results through object than image engagement, a second aspect of the study involved the potential for the use of collections in cross-disciplinary teaching applications. The content of various units of study were mapped against specific collections on campus as a way of testing the unused potential of existing museum collections at Macquarie University. From the mapping exercise it was clear from the outset that some academic disciplines use objects for teaching more than others. Discussions with unit convenors revealed that there is significant interest in using objects for teaching but this was hampered by two factors: (a) a distinct lack of knowledge about the content of academic collections at Macquarie, and (b) the existence of units where there is a high turnover of staff and a subsequent tendency to undertake minimal changes to content and pedagogy.

The mapping exercise above follows a standard pattern of establishing any existing object usage in tutorial or practical sessions during teaching programs, listing learning outcomes and linking key words to collection database searches. This is a standard methodology used by museum education developers and taught as part of both undergraduate and postgraduate Museum Studies programs at Macquarie University. More complex search methodologies can be devised but this mapping project was limited by the nature of collection information architecture at Macquarie University.

The mapping demonstrated the potential use of objects in the University’s Australian History Museum in the teaching of psychology, anthropology, sociology and environmental science and management. Works in the university’s Art Collection had potential for use in sociology, environmental science and history. Similarly, objects in the Biological Sciences Museum had use in early childhood education, indigenous studies, sociology and Australian history.

Sector investigations during the course of the project revealed a number of successful information management capacity building projects that would be useful models for possible adoption. The State owned Australian Museum has a volunteer program for digital capture. Macquarie University requires greater visual content capacity for the collections to be used more effectively in learning and teaching, particularly with the growth in delivery of online content. In education literature, ‘Millennial learners’ are perceived as having a higher threshold for visual data but not necessarily a more refined sense of visual literacy (BRUMBERGER 2011). The results from the Macquarie students exposed only to two-dimensional visual images confirms this and indicates that simply increasing visual content per se does not improve pedagogical outcomes. Apart from direct exposure to objects, this can only be done by improved integration of data and digital images. As noted above, an obvious extension to the experiment conducted for this project is to test information retention with students exposed to three-dimensional digital surrogates in comparison with those exposed to physical objects.

The project also involved an examination of best practices from around Australia (through the Council of Australian University Museums and Collections) and internationally where possible. There are many variations, but in general, with a few exceptions, cross-disciplinary learning and teaching strategies
using museum collections are often serendipitous rather than a result of institutional planning.\textsuperscript{2} They may be restricted to arts or science,\textsuperscript{3} but often involve integration into problem-based learning strategies.\textsuperscript{4} Some programs are clearly focussed on singular cross-disciplinary issues,\textsuperscript{5} and may involve external museum partners\textsuperscript{6} and occasionally extend to exposing students to research in learning and teaching strategies\textsuperscript{7}. Successfully utilising the cross-disciplinary potential of museums and collections requires the recognition that the university’s collections are learning and teaching infrastructure (JANDEL 2012). Small academic units, with discipline-specific collections often do not have the resources to maintain collections in a way that effectively incorporates them into widespread teaching strategies (SIMPSON 2012).\textsuperscript{8} The best example of cross-institutional integration in Australia is undoubtedly the University of Melbourne (ARNOLDI 2012). Collections come under a centrally funded ‘cultural collections’ program\textsuperscript{9} and the university has recently established (through philanthropy) a new position of ‘academic curator’ whose job is to utilize more effectively the 20 collections in learning and teaching programs with a focus on cross-disciplinary engagement. A similar privately funded national scheme among German universities was in late 2012.\textsuperscript{10}

**Extending the Macquarie University project**

Macquarie has a range of museums and collections within the Faculty of Arts and the Faculty of Science, which were originally established to underpin learning and teaching programs – such as the Museum of Ancient Cultures, the Australian History Museum, the Biological Sciences Museum and the Macquarie University Art Collection. The recent purchase of updated collection management software by the university’s informatics section allows for developing vast stores of collection data including images. Collection objects (documents, artwork) can be readily made available through two-dimensional imagery, potent pedagogical tools for a generation of learners with an altered sense of visual literacy (BRUMBERGER 2011) through immersion in social media technologies.

Recently, the Department of Ancient History commenced 3D laser scanning of selected objects in the Museum of Ancient Cultures to provide material for teaching programs. Three-dimensional images need to be sufficiently detailed so that the physical features of the object can be observed clearly at magnification. Consequently a Konica Minolta Range7 laser scanner was used in this project – because it provides instantaneous capture capability and enables the reproduction of the fine detail necessary for online research and study.

Using a Lenovo ThinkPad W520 workstation with Core 2 Duo processor, 4Gb RAM and a NVidia GT9000 graphics card, the Range7 was used to scan a group of artefacts from the museum collection. Raw scan data was manipulated in Geomagic Qualifier, a specialised software program which allows the scans to be aligned and digital photographic images to be wrapped around each object. The resulting images can then be converted into 3D PDFs using Tetra 4D 3D PDF Convertor. In this initial project however, because of time constraints, only the primed blank images were converted into 3D PDFs.

\begin{itemize}
\item E.g. Mt Holyoke College US, ALVORD & FRIEDLÄNDER 2012; DeLoit College US, BARTLETT 2012; University of Glasgow UK, GAIMSTER & FLETCHER 2012.
\item E.g. RICCIO 2012; VOLK & MILKOVA 2012.
\item E.g. GANGULY & AL. 2003.
\item E.g. Yale University US, PICKERING 2012.
\item E.g. LEMELIN & BENCZE 2010; MARSTINE 2007.
\item E.g. GRAHAM & JOMPHE 2010.
\item E.g. ALVORD & FRIEDLÄNDER 2012; DeLoit College US, BARTLETT 2012; University of Glasgow UK, GAIMSTER & FLETCHER 2012.
\item E.g. RICCIO 2012; VOLK & MILKOVA 2012.
\item E.g. GANGULY & AL. 2003.
\item E.g. Yale University US, PICKERING 2012.
\item E.g. LEMELIN & BENCZE 2010; MARSTINE 2007.
\item E.g. GRAHAM & JOMPHE 2010.
\item MARES made the same point in his 2011 UMAC conference presentation entitled The weakness of small units: why Sun Tzu could have been writing about university natural history museums”.
\item NEMEC, pers comm., 2011.
\item WEBER, pers. comm., 2012.
\end{itemize}
The use of 3D laser scanning for online teaching enables students to manipulate the 3D PDFs in order to examine, measure and quantify the artefacts – offering viewers a much more focussed interaction with the object depicted than can be achieved with 2D imagery. The images can be enlarged on screen to identify aspects of manufacture, structure and surface treatment. The condition of each artefact can also be assessed in this manner without the associated risks of damage and breakage inherent with a physical examination of the object.

We contend that Macquarie’s rapidly increasing digital capacity (storage and delivery), positions it to enhance learning experiences and accessibility to a cross-disciplinary range of three-dimensional objects in a ‘virtual object storeroom’. This could be part of a series of working virtual museum spaces enabling a diverse pedagogical experimentation and educational research.

This process of facilitating the development of virtual museum spaces will be enhanced by a program of accelerated digital capture of museum objects by Museum Studies students and digital volunteers (modelled on a program currently underway at the Australian Museum). Three-dimensional image capture using the scanner in the Museum of Ancient Cultures will form digital surrogates that, along with two-dimensional images in the Adlib database will form a cross-disciplinary virtual museum storeroom available for a range of innovative teaching applications.

The virtual museum storeroom will eventually be available to unit convenors. They will select and curate learning and teaching materials for the delivery of units on the University’s iLearn platform. Objects in the virtual storeroom will have a depth of linked data that will enable cross-disciplinary utilisation of single objects and the development of comparative learning contexts across varied units of study. Unit conveners and students will be able to tag objects as a means of building contextual linkages and tracing the history of utilisation of virtual objects in learning and teaching programs.

The virtual object storeroom will represent the ‘back of house’ area of the virtual museum space. A planned virtual front of house areas would also be designed to enable easy access to a range of discipline-specific or cross-disciplinary options. There are already many good examples of virtual exhibition spaces that allow multifaceted engagement by diverse online audiences that can be examined during the design phase of such a project. In recent years museum and educational researchers have given examples of the value of learning and teaching strategies that incorporate collaborative group work on exhibition development as a way of engendering deeper understanding within specific disciplines (MARSTINE 2007). For example, through using this platform, distance students would be able to select objects from the storeroom and collaborate in the production of exhibitions within modern or ancient history. Similarly, the development of virtual cross-disciplinary exhibitions will be possible for Museum Studies students. The platform will also enable the exploration

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11 The concept outlined here formed part of an internal grant submission to Macquarie University in 2012, although unsuccessful at that time, the proposers intend submitting a revised request in 2013.

12 One example is the Museum of Virtual Art at muva.elpais.com.uy (accessed July 4, 2013)
of new pedagogic concepts referred to by some theorists13 as ‘museum literacy’ conceptualised as embracing both object literacy and visual literacy.

Concluding remarks
While research on the educational value of engagement with 3D objects online is yet to be done, it is worth considering that other technological advances may render the question meaningless. The technology associated with three-dimensional printing is advancing rapidly (JONES 2012) with an expanding number of applications in manufacturing. Through the use of different materials and different printing methods, accessibility to this technology has increased to the point where small desk top units can produce intricate three-dimensional replicas of a vast diversity of human made and natural objects. Eventually this technology will find educational application.

Perhaps the university museums of the future will be digital storehouses of three-dimensional objects, available in a physical form on demand. These objects could be made from a recyclable material and used many times over. The same material could have a temporary existence as objects offering students direct engagement with a physical surrogate of the original object. Digital storage could provide material from collections anywhere in the world. The ability to access replicas of irreplaceable originals from some of the best collections could have a profound impact on the future of higher education. Imagine what downloading the Pharaoh’s Mask could do for the study of Egyptology, or a Tyrannosaurus skull for the study of palaeontology? The future options for collections linked to university teaching seem limitless.

Acknowledgements
The ideas developed in this paper extend from the experiment in object engagement reported by SIMPSON & HAMMOND (2012). This work was originally supported by a Macquarie University Learning and Teaching Priority Grant in 2010.

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University museums in Sri Lanka

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Abstract
Current status of university museums in Sri Lanka was evaluated. Results of questionnaire and interview survey revealed that the majority of universities lack museums. Two universities, including the pioneer University of Colombo, possess natural history museums administrated by curators. One of the oldest, University of Peradeniya, has a geological museum without a curator. Other universities possess a museum dedicated for Muslim culture, an art museum and an engineering museum. Poor infrastructure, dearth of finance devoted in corporate plans for development, lack of curators and absence of research were identified as major weaknesses.

Introduction
The functions of university museums are to assist the educational and scholarly mission of the undergraduate and research community through the study, exhibition, preservation and growth of collections. Does this happen in museums of Sri Lankan universities? In Sri Lanka, out of 17 state universities there are 14 that offer natural science and applied science subjects for undergraduates while three universities specialize in performing arts, religious studies and defense studies.

Methodology
Questionnaire and interview surveys were conducted to find the status and academic utilization of university museums in Sri Lanka.

Results and analysis
It was discovered that more than 50% of universities that offer natural and applied sciences lack museums of any type or condition. Two universities including the pioneer and the best ranking of the 17 universities, University of Colombo, and more recently established Sri Jayawardenapura University, possess specialized natural history museums with appropriate infrastructure. Each is administrated by a museum curator. One of the oldest universities in Sri Lanka, University of Peradeniya, has no natural history museum but a geological museum without a curator. The Open University of Sri Lanka dedicated for distant education possesses limited collections of specimens to facilitate undergraduate teaching but no separate museums have been established. Among all the university museums are an art museum and an engineering museum that are utilized for inspiration and exploration rather than undergraduate teaching. South-Eastern University possesses a museum dedicated for Muslim culture. Sabaragamuwa University which has formally established a museum recently has a substandard collection of items which do not satisfy the normal constitution or function of a museum. Universities dedicated to religious studies and defense studies as well as universities in war affected North (Jaffna University) and East (Eastern University) and their campuses lack museums.

Current evaluation reveals that majority of museums in Sri Lankan universities do not satisfy any function other than undergraduate teaching. In fact, natural science museums in universities are solely random collections of wet or dry preserved specimen used for undergraduate teaching. No Sri Lankan university museums facilitate research or hold voucher specimens.

Discussion
What should or could be happening in the currently deprived conditions of the university museums in Sri Lanka? Poor infrastructure and lack of curators are presently major weaknesses. The role of the
museum curator where present is restricted to maintenance of the collection. Museum curators are rarely involved with academic related teaching and research in a formal manner. Except for the geological museum, art museum and engineering museum, university museums are not utilized for stakeholder awareness and inspiration. Sri Lankan university museums are restricted to undergraduate teaching and the current survey sadly revealed that university museums are not open for the research community. This is related to bureaucracy and negligence. The university museums are simply considered as collection of old specimens. A change of attitude through awareness is a must if this scenario is to be altered in the future. The Fauna and Flora Protection Act imposes much hindrance in the enhancement of university natural history museums despite the biodiversity wealth of the country. The sole repository of specimens is the National Museum and the Department of Wildlife Conservation while university museums are not authorized to maintain such collections. Little funds are devoted in corporate plans to develop university museums. It is necessary to change the status of university museums by providing infrastructure and skilled personnel. Providing finance and freedom to generate finance by introducing courses for enthusiasts, and promoting education and awareness programs, are possible changes that could alter the current status. It is also necessary to encourage the research community to become involved with university museums by encouraging researchers and enthusiasts to work with university museums and publish their findings. Additionally university museums should be allowed to become type repositories to upgrade the status of university museums in Sri Lanka. Establishment and development of university museums in previously war affected areas in the North and Eastern sectors should be encouraged by appropriate funding.

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The university museum: respecting old values, embracing new directions

DOMINICK VERSCHELDE

Abstract
Preserving collections for future generations does not exclude finding new and modern uses for collections, thus combining 'old' materials with new ideas and modern technologies. In this article, I demonstrate how we use our collection specimens for knowledge communication while not only conveying scientific information, but also the historic and cultural significance of specimens; how they are used not only for classes and exhibitions, but for workshops where students determine group characters and find evolutionary processes, and for bachelor dissertations in science communication. We are developing workshops to be accessed by students through the internet while studying the actual specimens. We organize workshops on the use of the senses and the strength of the scientific method. Behind the scenes, we are conversing with others to form one university museum with a collective mission statement and an original niche within the museum community that corresponds with expectations of the public.

Introduction
Our first duty is to preserve collections for future generations to study and research the collections, and to help the public understand the knowledge behind the collections. How can we combine these primary duties interactively without endangering the specimens? In order to preserve them, we need to find new uses for these collections. As Michael Mares (2006) stated, museum collections form the thread that combines the past with the future.

To protect and serve
Protecting collections is not locking them away in a cupboard. By using them for research education, we ensure their future existence by demonstrating to those that fund us that collections render service to the public. The following list gives examples of lectures, workshops, practical courses that we organize in our museum with our collections, but which can to some degree be adapted with other collections.

Informing and educating the public in our museum is done on various levels:

1. Giving lectures to peers on conservation techniques, and associated tests in our museum.
2. Lectures to peers and students on marketing museums.
3. Lectures to students on how to give a presentation.
4. Lectures on 'what is a museum' and the code of museum ethics.
5. Suggesting bachelor theses on organizing exhibitions.
6. Suggesting bachelor theses on morphometrics: isometric growth studies on skeletons of related specimens or species.
7. Organizing practical courses and workshops.

For these we use, and need, our collection specimens. For example, in bachelor theses on isometric growth studies on skeletons of related specimens or species, students have to compare specific bones of different skeletons of related species or of the male and female within a species. The student takes digital pictures of the bones and using freeware
geometric morphometric software in order to visualize shape variation through grids being virtually positioned on the bones.¹

In a bachelor thesis on organizing an exhibition the student is confronted with three important aspects of the work of a scientist and biologist: (1) science communication ("how do I convey this subject or matter to the public?"); (2) organization ("how to create and establish an exhibition?"); (3) presentation ("with what means do I communicate this subject to the public?"). Exposing students to this challenge develops object literacy and museum literacy.

In practical courses on zoology conducted in our museum, bachelor students have to solve a list of questions by means of looking and studying the skeletons, thus learning the characters of vertebrates (different characters of reptiles, birds and mammals; positioning of muscles for use in locomotion and foraging, etc.).

A second part of that same practical course deals with convergent evolution (see below). These practical courses are part of the zoology curriculum, and are given by the curator or by assistants, but the professor of zoology also gives some lectures inside our museum, using the collection specimens to illustrate the lessons, eventually examining the students, using specimens from our museum.

Seavolution was a science education project with experiments, workshops, and lessons on marine biodiversity, genetics and evolution of sea organisms.²

A genetics workshop took place in the lab of our counterpart (Katho, Roeselare). Our own workshop for schools on vertebrate evolution was so successful, that although the project itself finished some months ago, teachers and professors of secondary schools, high schools and other universities still attempt to book this workshop for their students.

We run a course on the principles of variation, adaptation, speciation, and evolution, and on recognizing clues of evolution (Darwin 1859). During the workshop students have to look for clues to answer and discuss three questions:

1. Do species change and evolve more and more apart from one another (divergent evolution)?
2. Do unrelated species change to look more and more alike (convergent evolution)?
3. Can we see evolution at work or happening in front of us (do transitional forms exist)?

To solve the first question, the students have to recognize and identify at least four different skull bones and compare these between skulls of different species of pets and wild mammals. Studying these bones gives clues towards evolutionary tendencies. For example, when the nasal bone and frontal bone retreat (and the premaxillary bone lengthens), the nasal opening shifts backwards and tends to grow upwards. This can be observed in domestic pets (shorter snout either for puppy effect or for fighting purposes; Canis lupus: three dog races; Greyhound, Chihuahua, and Boxer), and in marine mammals (comparison of Procyon lotor, the Raccoon, with Monachus monachus, the Mediterranean Monk Seal; also when comparing Procavia capensis, Hyrax, with Elephas maximus, Elephant, and Dugong dugong, Dugong; and finally comparing Hippopotamus amphibius, Hippo, with Delphynapterus leucas, Beloega, and Orcinus orca, Orca).

The second question concerns the importance of a niche. When an animal becomes adapted to a certain habitat or niche, it then obtains a best suited shape for that niche. When unrelated animals (say a reptile and mammal) inhabit a similar niche, then they may have a similar form. The best known example of convergent evolution is that of the Thylacine and wolf or dog (fig. 1a & b) where not only the animals look alike, but also their skulls are very similar.

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² European Society of Evolutionary Biology: Outreach Initiative 2011. Title: Seavolution.
The third question deals with witnessing evolution and transitional forms. Transitional forms within the Skinkidae (Reptilia) (lizards with normal extremities [arms and legs], forms with smaller extremities, to form without extremities all together (fig. 2 a & b) suggest a transitional series within that group).

In the workshop Pond Creatures children and students look at the collection specimens to see protists, invertebrates and vertebrates. Then they go out to collect their own samples which they must identify.

In our extended Sensible Senses workshop, children and students learn through fun exercises and experiments how important it is to use all our senses in order to make good observations and critically analyse them. Through these exercises and ‘games’ the children and students are positively confronted with the scientific methodology and the power of critical reasoning.

Based on the response we get, we notice that organizing all these workshops and programs gives much satisfaction not only to us but also to the students and teachers. However, we have not yet surveyed the students who have done these programs to see whether there was any statistical change in attitude to the subject area, nature in general, the museum, and/or the university.
Modern times

Having organized a number of different workshops, we are now working to make these accessible through the internet. We will offer these digital workshops as several different components that can be chosen and combined by the ‘customer’ into packages of their own choice.

We want to experiment with 3D pictures of skulls and other skeleton parts or organs, using ‘Vi3Dim’ which is a software package that generates a 3D surface image based on ordinary video camera pictures. With this process there is no need for a laser scanner.

Surviving in modern times implies not only being aware of interesting technologies, but also that you are aware of the contemporary interests and issues of the community. In 2012 our exhibition Olympic heroes? provided a comparison of the sport achievements of Olympic and world gold medallists with the abilities of animals in similar events. It is a good idea to add historical and cultural context to your own subject of expertise in exhibitions. Thus, to give an example, we demonstrated that although Usain Bolt can run the 100m in 10.59 sec (almost 38km/h), a greyhound runs at 66.8km/h, the cheetah runs at 120km/h, and the tiger beetle (Cicindella species) even runs at the speed of 8km/h. This last result seems not so much at first, but if a tiger beetle would have the size of Usain Bolt, it would run the 100m in 0.7 seconds (a staggering 466km/h).

Behind the scenes

University museums always have to look over their shoulder. Even though science communication is a major issue for many organizations which provide important funding, university governments often still are convinced that science communication needs to come from their professors and researchers in their labs, even if these academics see themselves as researchers and teachers, but not as ‘communicators’. Even when the staff of university museums think of and organize a ground breaking new idea university management need to be persuaded of its importance.

It is a matter of having to constantly assert our value to those that make management decisions. The importance and difficulties of this issue have been discussed by Michael Mares (2006).

Thus, behind the scenes, and within our university walls, we are combining our thoughts with several collection curators and directors to form one university museum with a collective mission statement; hoping to form the Gent University Museum(s). Our group (Archaeological Collection, the Botanic Garden, the Ethnographic Collection, the Morphology Museum, the Museum for Medical History, the Museum for the History of Sciences, and the Zoology Museum) aims to obtain a regional recognition, 2017 could be a quadruple anniversary: 200 years Ghent University (bicentennial birthday), 200 years Ghent University Zoology Museum, 20 years as the first Flemish university museum curator, and hopefully the birth year of the Ghent University Museum. Combining different collections together is no easy task, but we have to take hart, as in France university museums were even able to organize themselves towards cooperating among different universities. The importance of 'strength in numbers' was also commented on by Michael Mares in Lisbon.

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6 Conference in Strasbourg, February 2012.
7 UMAC Conference 2011, oral communication.
The Ghent University is starting to recognize the importance of reaching out to primary and secondary schoolchildren as well as high school students. Last year the university, together with several professors and scientists of the science faculty, organized the *Children’s University* on a Saturday. We presented a program of lessons and practical courses from which the attending children could choose a curriculum for the day. After their days work, they each received a *Children’s University* diploma. Contributing to this event our museum organized the practical course *Sensible Senses*, on the use of the senses and the importance of critical thinking (for example, we demonstrate that ‘tasting’ ones food is not just a matter of using ones taste buds, but that it is the result of combining four observations: when ‘tasting’ you see the food, than smell the food, even touch and feel it with your tong, and finally you use your taste buds; that’s why we say “it smells delicious” as it is a part of tasting).

**Conclusion: Let’s stick together**

Museums could be considered as a unique species of marsupials that has been on the brim of extinction for a long time. We will have to stand up to placental competition with vigour in order to survive and defend our territory.

Maybe we need to organize (from within UMAC) a worldwide uniform university museum studies program to which we all contribute pending on our specific field and experience. This program could then be presented, and organized as a summer class curriculum, in our universities all over the world, making it an undeniable asset to the education of students. I would like to invite all of you who are interested in this and have constructive ideas on the subject to communicate with me, UMAC and each other: there is strength in numbers!

**Something to think about**

Procuring, distributing and sharing knowledge obtained by critical reasoning is the main objective of scientists. I’m convinced that it is our duty to share this knowledge with the general public, meanwhile conveying the strength of the scientific methodology and the importance of critical reasoning. But I have also observed that for some children or people ‘science’ can be a bit of a scary word. So, I would like to suggest using ‘knowledge communication’ instead of ‘science communication’ in the future.

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Unlocking the value of practical learning: A museum conservation perspective at the National University of Singapore Museum

LAWRENCE CHIN, MICHELLE KUEK & CLAIRE LIM

Abstract
Practical knowledge and its acquisition can often be hampered by a lack of real-life situations to learn through the act of reiterative processes. University museums are uniquely positioned to offer opportunities that promote practical learning by being connected to a network of tertiary scholarship, on the one hand, and actual operational needs of an organization anchored in real-world experiences, on the other. This paper is an attempt to highlight the range of programs that have been undertaken through a variety of models of collaboration and funding that seek to enhance practical learning through a museum conservation practice viewpoint.

Introduction
The value of learning through practice, or what has been termed as situated learning (LAVE & WEIGNER 1991; LAVE 1996), has gained wide acceptance and adherence. Museums, in general, and university museums, in particular, are institutions that are well-suited to the notion of communities of practice (SMITH 2009) that enable such learning to take place. Even though there is broad agreement in the value of learning through practice, nevertheless, the actual resources needed for sustaining such a practice of learning may be financially daunting and, in the specific context of a university museum, difficult to secure for one reason or other.

Working with constraints
It is against such considerations that The Conservation Studio was set up as a public-private-partnership at the National University of Singapore (hereinafter called NUS) Museum in 2008. The utmost and primary intention was to provide in-house conservation services for the museum's holding collections, exhibition programs and loans. However, a clear intention and focus from the start was also to provide a vehicle for the realization of programs that would raise the awareness of conservation and preservation practices. Such a broad-base approach to learning in the museum through conservation practice was to be undertaken over and above the more technical aspects of conservation and preservation work in a museum context.

An immediate consideration was to secure funding for such programs. The specific arrangement between The Conservation Studio and the NUS Museum for the payment of rental for use of the museum conservation workspace helped to create a ready source of internal funding which could be channelled for conservation-related work on the museum's collections and exhibitions or the realization of programs, taking the forms of talks, workshops, internships and professional exchanges.

Talks and workshops
One of the more cost-effective ways, in terms of time management, of disseminating information is via educational talks. However, a delivered talk is also the least conducive environment to experience learning in a practical setting. Therefore, the choice of the content of the talks has been carefully selected to reflect a consistent emphasis on materials, practices and principles related to museum conservation work. In particular, the emphasis of the talks would focus on the value of learning through the actual process of discovering and interacting with materials.

A well-received talk, Colors as Objects, looked at the combination of historical development of artists' pigments as well as the chemical and physical basis of understanding the phenomena of color. The
role of colors in connoting social status and wealth was juxtaposed with the very early tedious and labor-intensive process of manufacturing these same colors. This allowed the audience to rethink their relationship with colors and also understand some manner of working with colors.

Coupled with the talk, a workshop for students from the School of the Arts in 2011 was also developed. The set-up for this practicum allowed the students to experience the various ways of investigating materials and colors through ultra-violet illumination, infrared imaging and microscopy. This helped to concretize the learning points of the talk for the audience, even though it required more preparation, effort and time.

**Internships**

In tandem with talks and workshops, The Conservation Studio accepts a number of student interns each year. As there are no formal training programs for conservation or museology in Singapore, such internships has become a means of introducing the fields and creating a pathway into these highly technical and professional fields for the students.

Students are exposed to, and supervised for, a variety of conservation-related work in assessing and surveying collections, implementing preventive conservation measures, preparatory work for exhibitions and loans, and actual conservation work on artworks and artefacts. With additional income from working on collections outside of the NUS Museum, the studio has been able to set aside some funding to pay for a stipend for all the student interns.

The selection of the student interns was based largely on interest and self-motivation in approaching the museum or studio to request for an internship. Owing to the lack of formal programs in Singapore mentioned earlier, the range of academic backgrounds that the student interns come from has been diverse, including arts management and fine arts (from LASALLE College of the Arts); Southeast Asian studies, literature and facilities management (from National University of Singapore); photography (from Nanyang Technological University); and high school students (from NUS High School for Science and Mathematics and Raffles Institution).

The eclectic mix of student interns has also been instrumental in fostering an environment where interaction and openness are valued. As a result, the student interns have been able to learn rapidly and keenly, even though they were exposed to an unfamiliar field of knowledge and practice. The informal nature of the program, although time-consuming at times, also encourages a wider sense of curiosity and self-directed learning both within and outside of the studio.

**Professional exchanges**

Continuing education for professionals already in the museum field is an important aspect of the learning and updating of knowledge required in our fast-changing world. However, conducting a full program for museum professionals can be highly resource intensive, as well as expensive for participants having to pay for travel, accommodation and the participation fee.

An alternate model, arising from two separate requests from Galeri Petronas (located in Kuala Lumpur, Malaysia, which requested for preventive conservation training) and Lopez Museum (located in Manila, Philippines, which requested for microscopy training), was trialed at The Conservation Studio in collaboration with NUS Museum. Each workshop was organized around the needs and experience of the participants in mind, with a range of topics and activities to suit the learning outcomes. In order to help reduce the overall cost of attending the workshop, the participants’ fee, which paid for the trainer's salary, was funded directly by NUS Museum, utilizing the funds accrued from the rental of the conservation studio. A more responsive approach in the planning stage of the
workshop was also evident as the funding for the trainer was kept flexible, depending on needs, yet fully covered.

Making small progresses
Although the primary function of The Conservation Studio is not one of education, the engagement with various individuals and organizations has helped to open up a richer understanding of the larger learning and educational communities, in addition to the museum and heritage communities. Such accrued awareness can be useful as feedback for future practice in trying to stay relevant to the society at large.

Even in trying to establish a practice-based context for learning, it is also important to be aware of the limitations and short-coming of such an approach (Anderson, Reder & Simon 1996; Roberts 2006). This paper highlighted some of the issues related to intensive use of resources and time needed for an effective transfer of knowledge in such practice-based settings. Nevertheless, the benefits and necessities of such practice-led learning remain clear, albeit as a complimentary approach to learning and knowledge acquisition in today’s world.

Extending and practicing communities
Through a range of programs, that seek to compliment the larger mission of the NUS Museum, an additional intangible effect was establishing linking to other institutions of learning with the hope of familiarizing the next generation of students with museum and heritage work. This is to put in place some semblance of a community of practice which would consists of a flexible network of interested and dedicated individuals or organizations working towards the realization of long-term museum-related and heritage-related objectives.

The specific focus on museum and heritage of such a community of practice must also in turn seek out and interact with other like-minded communities of practice in order to facilitate a broad-ranging exchange of ideas and practice. The university museum is unique in that it is already positioned between academia and material collections, between learning and practice, between thinking and doing. And that would be its greatest intrinsic value and work.

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