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Integrated, Interactive Learning in Museums

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INTEGRATED, INTERACTIVE LEARNING IN MUSEUMS

by

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The following individuals read and discussed the project submitted by student Terra Feast, and they evaluated her presentation and response to questions during the final oral examination. They found that the student passed the final oral examination.

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The final reading approval of the project was granted by Kathleen Keys, Ph.D., Chair of the Supervisory Committee. The project was approved for the Graduate College by John R. Pelton, Ph.D., Dean of the Graduate College.

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AUTOBIOGRAPHICAL SKETCH OF AUTHOR

Terra Feast is the Curator of Education at the Boise Art Museum. Terra began her career at the Tucson Museum of Art and Historic Block in Tucson, Arizona. She joined the Boise Art Museum as the Associate Curator of Education in 2005 and has 12 years of experience in museum education. She holds a BA in Fine Arts from the College of Idaho.

ABSTRACT

For this project, I researched, developed, and integrated, interactive and participatory educational components directly into the Boise Art Museum's (BAM) exhibition spaces in order to create more pathways for learning about art among different types of visitors. My project is based on a review of best practices in museum education and visitor engagement, focusing on in-gallery interactive and participatory learning opportunities, as well as in-depth, onsite research conducted at five leading museums in London, England. After I returned from London, BAM received funding from the Institute of Museum and Library Services (IMLS) to support the integration of in-gallery educational components into two long-term exhibitions. The funding enabled me to put my research findings into real-world practice and create new educational components tailored to the museum's size, staff expertise, and audiences.

Based on a thorough review of best practices in museum education, the in-depth research at five London museums, and past experiences as a museum educator, I developed and implemented a range of in-gallery, interactive, and participatory educational components at BAM. These interactive components were designed to transform the traditional, passive viewing experience into an active or participatory experience in order to improve learning about art among visitors.

The extended timelines of the exhibitions, each of which was on view for approximately one year, allowed for significant testing of the interactive components and

an in-depth assessment of the impact on visitor learning. Evaluation activities included timed observations of visitors in the galleries, randomly collected exit surveys, and visitor usage statistics and feedback from the interactive computer-based components.

The data shows that, cumulatively, approximately one-third of visitors to the exhibitions used one or more of the new educational components. Survey respondents who used the interactive and participatory components consistently referred to content available only through these components when referencing specific artworks and articulating memorable highlights of the exhibitions. The project created many options for audiences to engage with the artworks, and data from the formal evaluations suggests that the new components successfully impacted learning.

The results of this project support my belief that in-gallery, free-choice interactive and participatory educational components create more pathways for visitors to learn about artwork and lead to a more rewarding museum experience.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

LIST OF ABBREVIATIONS

BAM	Boise Art Museum
BSU	Boise State University
IMLS	Institute of Museum and Library Services
LIRP	Learning Impact Research Project

CHAPTER ONE

Introduction

As the Curator of Education at the Boise Art Museum (BAM), my primary professional goal is to ensure that effective educational opportunities are woven into the visitor experience for all BAM audiences. For this project, I researched, developed, and integrated, interactive and participatory educational components directly into the Boise Art Museum's exhibition spaces in order to create more pathways for learning among different types of visitors.

My project is based on a review of best practices in museum education and visitor engagement, focusing on in-gallery interactive and participatory learning opportunities, as well as in-depth, onsite research conducted at five leading museums in London, England. I first visited London for a semester in 2000 as an undergraduate student studying fine art and art history at the College of Idaho. A major component of the trip involved visiting London's most significant art and history museums, as well as art galleries and historical sites. The amazing experiences I had in these world-class museums—the Victoria and Albert Museum, the British Museum and Library, and the Tate among them—influenced me to pursue a career in museums, specifically art museum education. In 2011, after more than 10 years working as an art educator in museums, I had the opportunity to reprise my trip to London, this time as an advisor to a College of Idaho undergraduate class. I jumped at the chance to revisit London and the

many museums that had proved so influential to my career, and to use my perspective as a museum professional to gain a greater appreciation of these institutions as educational destinations.

A number of important developments had considerably altered the museum landscape in London in the decade since my prior visit. In December 2001, the UK Department for Culture, Media & Sport instituted universal free admission to all major national museums, many of which had previously charged admission fees. This move was supported in part by a robust National Lottery program that provided additional funding to museums through subsidies and grants. From 2001 to 2010, visitation to museums that had previously charged admission fees increased by 158%, and even visitation to museums that had always provided free admission increased by 21% (Department for Culture, Media & Sport 2013). National Lottery funding also enabled many museums to complete large-scale facilities renovations, reinstallations of their collections, and special exhibitions and educational projects to better serve their growing audiences. At the same time, the government of Great Britain sponsored an in-depth study on the effectiveness of museums in educating children (see Chapter 2 for an overview of this study), signaling further recognition of the important role museums play in the community.

Another change in the cultural sector was initiated in 2005, when London was awarded the 2012 Olympic Games. In addition to building the new facilities and infrastructure associated with the Olympic enterprise, the government of Great Britain made a conscious effort to "put art at the heart of the Games themselves, showcasing UK world class excellence with high economic stakes to play for cultural tourism and

creative industries" (Arts Council England 2013). In 2008, the UK launched a four-year Cultural Olympiad designed to engage citizens and tourists in arts and cultural activities, support risk-taking projects among artists, and ensure widespread participation in the arts across socio-economic barriers. An emphasis was placed on free attendance and activities at museums, galleries, and cultural organizations, as well as active participation among audiences. Programs that invited audiences to create, perform, respond, and interact were introduced across the country, with museums often at the forefront. By the time of my visit to London in 2011, more than 4 million people had participated in the Cultural Olympiad (this number would increase to 5.9 million by the culmination of the project in 2012) and arts and cultural activities were riding a wave of popularity (2013).

I conducted my research on interactive and participatory programs integrated into museum galleries against this backdrop of free admission and new programming. My academic and professional objectives coincided when the Boise Art Museum (BAM) received funding from the Institute of Museum and Library Services (IMLS) to support the integration of in-gallery educational components into two long-term exhibitions.

I was a member of the BAM staff team in 2009, when the museum originally applied for IMLS funding to support the integration of educational components into its galleries, approximately two years before my research project in London. The 2009 grant application was not funded, but IMLS provided feedback and encouraged BAM to reapply. Specifically, IMLS reviewers suggested including a more detailed discussion of the impact on audience engagement and learning BAM hoped to achieve with the project as well as a detailed evaluation plan regarding the new educational components to assess their effectiveness. BAM submitted a revised grant application in late 2010, two months

prior to my London trip, with a broader discussion of BAM's goals in creating new in-gallery educational opportunities, along with a general outline of proposed educational components and a thorough evaluation plan.

The IMLS grant application was still pending when I conducted my research in London in early 2011. The onsite research provided a wealth of concrete examples showing how museums integrate interactive and participatory educational components into their galleries, and helped me to significantly refine and modify the general ideas I had proposed in the IMLS grant application. Shortly after I returned from London, BAM received notification that the grant application had been funded in full. The funding enabled me to put my research findings into real-world practice and create new educational components tailored to the museum's size, staff expertise, and audiences.

CHAPTER TWO

Why Integrated and Interactive Education in Museums?

The availability of in-gallery, interactive and participatory educational opportunities is a relatively new development in museum education. Traditionally, museums have emphasized a broadcast model of education, in which a visitor looks at whatever objects and content is on display (La Senna 2010, 189). The rise in new educational theories in the late 20th century, which focused on experiential learning, heralded a change in the way museums approached informal or in-gallery education. Museums are now shifting from the traditional broadcast model of in-gallery education to a 21st-century model of education emphasizing interactive and participatory learning.

Research conducted over the past 20 years also shows that free-choice learning is a central experience of museum visitors. In *Identity and the Museum Visitor Experience* (2009), John Falk states, "all visitors to museums realize that these are educational settings. Some come to learn explicitly, some come to learn implicitly, but all come to learn" (56). For the casual visitor who does not participate in a formal, organized educational class or program at the museum, free-choice learning is the predominant experience. Free-choice learning may be defined as those learning experiences over which an individual has choice and control. As noted by Falk and Dierking in *The Museum Experience* (1992), museums are inherently free-choice learning environments:

> Visitors do not respond passively to exhibits and labels. Rather, they become actively involved in their immediate environment…. As they move through the museum spaces, visitors selectively look at and examine objects and labels in exhibits. They ask questions about what they see, hold discussions with each other, and attempt to personalize and make sense of what they see. The important aspect of their activity is that it is selective. Visitors choose, sometimes apparently randomly, what to focus on. (67)

This characteristic of museums is potentially one of their greatest educational strengths because "learning experiences that incorporate choice and control are among the most powerful and memorable" (Falk 2009, 42). However, free-choice learning is optimized only when museums provide multiple options for engaging with the objects on view. Leading researchers of learning in museums emphasize that every museum attracts a wide variety of visitors, who exhibit a wide range of learning styles and motivations (Wilkening and Chung 2009, 25). The needs of these diverse visitors must be met with an equally diverse range of interpretive and educational opportunities, embracing traditional didactic methods as well as interactive and participatory experiences.

Broadly defined, interactive experiences in museums are those that invite some form of visitor engagement or action beyond looking at objects or labels. Interactive learning tools emphasize the visitor's active role in seeking out information. As Nina Simon states in *The Participatory Museum* (2010), "visitors are always somewhat active in their pursuit of interpretation, deciding whether or not to read a label," referring to the free-choice characteristic of museum experiences (37). An interactive experience, in contrast, "requires visitors to retrieve interpretive material rather than passively viewing

content" on display (37). The focus is on the process of learning rather than rote acquisition of facts or content, and gaining the skills to observe, question, and make judgments or interpretations independently (Hooper-Greenhill 2007, 13). Interactive experiences often (though not always) engage visitors through physical or sensory activity, whether through touch, talking, smelling, tasting, or listening. This type of sensory engagement bridges diverse learning styles and encourages an emotional connection with the objects, leading to a more personalized and memorable experience for visitors (Lamb 2010, 163).

For many museum educators the terms "interactive" and "participatory" are interchangeable, indicating active involvement among visitors. However, Nina Simon further delineates these concepts by defining participatory experiences as those in which visitors actively "contribute their own ideas, objects, and creative expression to the institution and each other," whereas interactive experiences engage visitors in some form of action but do not require them to contribute their own content (2010, ii). For Simon, a key aspect of participatory experiences is that they "promote the social experience over the personal experience," meaning that visitors share and discuss what they see and make during their visit, and connect with other people, whether it be staff, visitors, or artists (27). According to this definition, participatory experiences may range from visitor comments about an exhibition posted publicly in a museum, to groups of visitors creating content for display or working with the museum to define and complete a project. Like interactive experiences, participatory experiences can significantly impact visitor learning in museums because they emphasize personal discovery and create opportunities for people to directly connect with the objects on display (Burnham and Kai-Kee 2011, 46).

Research suggests that more visitors are increasingly looking for interactive and participatory learning experiences in museums, though not all audiences require the same levels of interaction, and some visitors may even prefer the traditional broadcast model of looking. We live in an age where people "seek interactive communication. They are accustomed to inserting themselves in various situations as they publish their own books, maintain their own blogs and websites, and make their own music that they then distribute, promote and network" (La Senna 2010, 194). People are no longer satisfied to listen or look passively; they want to contribute their own interpretations and opinions, engage physically with museum objects, search for their own answers to questions, manipulate machines, hear sounds, create their own artwork, and take part in dialogue about museum exhibitions. Visitors desire opportunities to engage in activities as a social group, rather than individually. This is particularly true of family groups, who "value museum experiences that allow them to interact with objects and each other in a meaningful way" (Adams, Luke, and Ancelet 2010, 24). Museums must create interactive and participatory experiences for those visitors who expect such active involvement in order to remain relevant to a broad public audience.

I have observed audience demand for interactive and participatory experiences at BAM as well, particularly in relationship to the museum's interactive educational space, the ARTexperience Gallery. This space includes hands-on games, touchable artworks or art materials, magnets, puzzles, books, and computers. The ARTexperience Gallery also features popular interactive displays that relate to the exhibitions on view elsewhere in the museum. For example, in conjunction with the 2007 exhibition, *Chuck Close Prints: Process and Collaboration,* BAM installed a display of printmaking tools and materials

along with a "make your own print" station with paper, ink, and stamps. Visitors had overwhelmingly positive feedback about this display, noting that it provided a greater understanding of the printmaking process and the skill required to create the prints in the *Process and Collaboration* exhibition. Unfortunately, this display only served individuals who entered the ARTexperience Gallery. While any visitors may use the space, it is specifically designed to engage visitors ages 12 and younger accompanied by an adult and is mostly utilized by family groups. Adult visitors without children often bypass the space altogether, and even families may not enter the gallery if they have older children.

Recognizing that many visitors were missing the interactive displays in the ARTexperience Gallery, I began experimenting with small, interactive displays in the museum's other exhibition spaces. Inspired by the ARTexperience Gallery display for *Chuck Close Prints: Process and Collaboration*, I placed a variety of printmaking tools on a table in the exhibition space, where visitors could handle the tools in reference to the artwork on view. This simple display was incredibly successful in providing visitors with additional insight into the printmaking process. Since then, I have continued to place interactive elements into select exhibitions, including touchable samples of art materials or tools, or a laptop computer with a program related to the artwork. These components have been extremely popular. Other interactive and participatory components, such as a voting station at which visitors could answer a question about an exhibition by placing a wooden nickel in clear containers, and an audio guide accessible on a hand-held device that may be checked out, have also been well received by visitors.

However, these components also have been a late addition to the exhibitions as opposed to an integral part of the exhibition design, and have been designated for only a

few exhibitions rather than broadly implemented. Because the components have proven so effective in engaging and educating visitors, I felt it was imperative that BAM include these types of free-choice interactive and participatory elements into its exhibition spaces on a regular basis.

CHAPTER THREE

Research of Free-Choice Educational Components at Five Museums

In order to gain a better understanding of how free-choice, interactive and participatory educational components integrated into museum exhibitions impact visitor learning, I researched the educational opportunities incorporated into the galleries of five of the most significant museums in London, England: British Museum, Museum of Childhood, Museum of London/Docklands, Tate Modern, and Victoria and Albert Museum. I strategically selected these institutions as the basis for my research, in part, because they cover a variety of primary subject matters and objects (contemporary art, place-based history, design and art history, objects related to childhood, etc.), allowing for a comparison of learning opportunities across different types of museums. The location of the museums in one city also enabled me to conduct in-depth, onsite research with multiple visits to each institution. As a result, I not only collected information about the educational components available at each museum, I also observed visitors within the galleries and personally tested the educational components.

Another important consideration in selecting these museums as the basis for my research is the extensive work conducted by the government of Great Britain in the past 15 years to fully integrate cultural institutions such as museums, archives, and libraries into the public education system. From 2001 through 2006, the British government funded an extensive, nationwide research and evaluation project to assess the

effectiveness of museums in educating visitors, particularly primary school children (Hooper-Greenhill 2007, 3). The *Learning Impact Research Project (LIRP)*, conducted by the Centre for Museums and Galleries in the Department of Museum Studies at the University of Leicester, found that learning in museums often "occurs through mind and body working together" through interactive and participatory experiences (Hooper-Greenhill 2007, 170). In particular, the LIRP also found that "physical immersion in carefully designed experiences where exploration of objects and sites stimulated bodily engagement" was highly effective in motivating students to participate and aiding student recall of content and ideas (171). Similar conclusions were reached in visitor studies conducted at individual museums in the United States by leading researchers including John Falk, Lynn Dierking, Beverly Serrell, and Nina Simon, among others. These studies found that "participatory techniques have the particular ability to help visitors develop specific skills related to creativity, collaboration, and innovation…often referred to as 21st century skills" (Simon 2010, 193).

The LIRP also identified barriers to learning for museum visitors in general as the result of a predominant museum philosophy marginalizing education. The study noted the learning experiences provided for and experienced by school children, in most cases, were not available to casual visitors. Museum educators took great care to create interactive opportunities for children visiting with their classes and teachers as part of a formal school program, but these interactive experiences were largely restricted to special study areas or studios separated from the museum exhibitions, usually with trained facilitators to guide the students. The LIRP found that the experience of most visitors to museums participating in the study was based on a traditional approach to learning—

learning by looking at a glance—which is "very different from the performative, embodied approach that…proved so successful for the school pupils" (Hooper-Greenhill 2007, 192).

Contemplative looking may be an appropriate learning strategy for some visitors, and even may be the preferred mode of experiencing the objects in a museum among select visitors. However, research shows that museum visitors have different motivations, learning styles, and expectations of their experiences (Falk and Dierking 1992; Wilkening and Chung 2009). Drawing on this research along with its own data, the LIRP found that simply "putting things out on display for visitors to learn through looking is no longer enough to achieve the educational purposes of museums" because "learning through looking" is effective for only a percentage of visitors (Hooper-Greenhill 2007, 13). Instead, museums must consider implementing broader interactive and participatory learning opportunities for many types of visitors in order to better serve a general, diverse public audience seeking educational fulfillment. The results of the LIRP and its recommendations for museum education prompted an increase in the development of interactive and hands-on learning components within British museums, making them ideal subjects for my research on free-choice, interactive and participatory learning opportunities integrated into museum exhibitions.

My research took place during a five-week period in early 2011. Throughout my research, I focused on identifying and analyzing the educational materials, interactive components, or learning resources accessible to casual visitors as opposed to those designed for students or adults visiting as part of a formal school program, event, or instructor-guided class. Special attention was given to free-choice, interactive and

participatory components integrated into gallery spaces. Five questions (see Table 1) guided my research:

Table 1. Research Questions

Research Questions
What is the museum's mission, and is education central to this mission?
Are there dedicated interactive educational programs/components at the museum?
Are the interactive educational programs/components integrated into the galleries or separate from the primary exhibition spaces? Describe.
In what other ways does the museum integrate educational programs and materials into the exhibitions?
How does the museum understand, gather information, and interpret the visitor experience?

I conducted a minimum of three research visits to each museum, with additional visits as deemed necessary to collect information and experience a range of educational components. For my first visit to each institution, I intentionally assumed the character of a casual, first-time visitor on a busy weekend. I conducted no pre-visit research on specific exhibitions or educational programming, and did not take notes or speak to my professional colleagues while at the museum. Instead, I followed the in-gallery signage and maps, wandered through the exhibition spaces at random or according to routes suggested on the maps, and briefly tested some interactive educational components. On my second visit, I attended a designated children's or family day in the middle of the week to gauge whether different interactive components were available to different audiences (tourist-heavy weekends versus local, multi-generational visitor groups during the week). On my third visit, I used and tested every available interactive component,

observed other visitors' use of the components, and recorded my findings and observations.

During subsequent visits, I gathered didactic materials provided to visitors, checked out family backpacks and guides for testing, recorded a digital image of each interactive component, and made notes on efforts taken by the museum to assess the visitor experience such as visitor comment stations, surveys, or requests for feedback on a specific interactive component or exhibition. In some cases, I spoke with volunteers conducting demonstrations, asking questions about their backgrounds and training. I also spoke to education staff members while checking out materials and observing visitors in order to gain information about the frequency of programs, the popularity of specific interactive components, and methods for gathering participant feedback.

After the five-week onsite research period, I reviewed and analyzed my notes in conjunction with materials collected from each museum. I conducted additional off-site research when I deemed more information was required to accurately answer my guiding research questions. Some of this information was accessible online, including museum mission statements and detailed descriptions of educational programs or materials. I then prepared a comprehensive chart describing each educational component and comparing these components across the five institutions (see Appendix A). While this chart may be referenced for a detailed overview of my research findings, the following sections provide a general discussion of each museum, as well as in-depth explorations of selected components that were particularly compelling or useful in my subsequent development of new educational opportunities at the Boise Art Museum (BAM).

British Museum

According to its mission statement, the British Museum "holds in trust for the nation and the world a collection of art and antiquities from ancient and living cultures" (2013). A specific goal of the museum is to engage with a worldwide audience and encourage cross-cultural investigation, understanding, and learning. The museum's exhibitions are organized chronologically by culture, with objects ranging from antiquity to present day. The museum has a strong historical object orientation, with some artwork integrated into specific exhibitions and time periods.

The primary interactive educational component offered at the British Museum consists of six permanent stations where visitors may handle objects (real and replicas). The stations are staffed by volunteers and open daily from 11:00 a.m. through 4:00 p.m. The museum provides a printed thematic guide with more information about select objects, with icons on object labels indicating tour stops. The thematic tours also may be accessed as an audio guide on mobile phones and ipods. An interactive touch tour is available for visually impaired visitors, with museum staff guiding tour participants to touchable objects on display (note: only participants on these tours may touch the objects, under supervision; the option is not available for casual visitors).

Families may check out backpacks with printed thematic guides and hands-on activities for use in the galleries. A library and research center, separate from the exhibition spaces, is free to visitors and serves as the information desk where backpacks, books, and printed thematic guides may be obtained. The center also contains computer stations at which visitors may search for information about objects in the collection. Traditional, printed didactic materials are available, including brochures and object labels

augmented with diagrams, artist drawings, and maps. Magnifying glasses placed inside cases help visitors distinguish features of small objects and are useful though not interactive features of the exhibitions. I observed no public comment books or feedback stations to collect information about the visitor experience, and was unable to confer with staff regarding their methods for gathering visitor feedback.

Case study at the British Museum: backpack program.

The British Museum's backpacks are available to families for check out during open hours. Each backpack includes six learning activities that relate to a specific theme. A spiral-bound notebook with heavy-duty, laminated pages provides instructions on completing the activities that correlate to different age groups. The notebook also provides directions to specific objects in the galleries. The materials necessary to complete individual activities are contained in mesh zipper bags within the backpack. Materials may include costumes, magnet boards, games, replicas of historical objects, books, printed images, vocabulary cards, and other items.

For example, one of the backpacks focuses on objects from ancient Greece. One activity, "Set the Scene," includes costume pieces that relate to drawings of ancient Greeks on ceramic objects in the galleries. Children are encouraged to wear the costumes and discuss what the clothing reveals about ancient Greek life. For the "Visit the Temple" activity, children are instructed to use architectural shapes on a magnet board to reconstruct an image of the Parthenon. A vocabulary list with definitions accompanies the activity. The "Sport" activity includes printed images of sports from modern Olympic games, with instructions to match the modern sport to an image on ceramic vessels in the gallery. Correct answers are provided on the back of each printed image. The "Fun and

Games" activity does not connect with one specific object in the exhibition. Instead, it asks families to find a quiet corner of the gallery to sit and play a game called "knuckle bones," which was popular in ancient Greece. Another activity, "Smell," includes three small plastic vials that contain a substance with a specific smell. Children are instructed to search the gallery for the type of ceramic vessel that corresponds to each smell, such as a lamp that held olive oil or a bowl that held fruit. The backpack also includes a "Tell the Story" activity, in which children may use magnet images on a board to create a story about ancient Greece.

The backpack program at the British Museum is an excellent example of a low-cost method of incorporating free-choice, interactive learning opportunities for families into an exhibition. The backpacks are free to visitors; an adult ID card is kept in exchange for the backpack to ensure materials are returned. The instructions for each activity are well written, materials are durable and relate to objects in the galleries, and the activities are engaging and adaptable to different ages. Families and children are not required to complete every activity, and activities may be conducted at leisure within the galleries. The activities help to personalize the experience with objects on display and encourage an exploration of objects through touch, play, movement, and inquiry. The backpack program at the British Museum emphasizes direct involvement, personal discovery, and creativity activity, all of which contribute to a memorable and successful learning experience (Burnham and Kai-Kee 2011).

Museum of Childhood

The Museum of Childhood houses the Victoria and Albert Museum's collection of childhood-related objects including toys, games, clothing, furniture, art, and

photographs. The mission of the Museum of Childhood is to "enable everyone, especially the young, to explore and enjoy the designed world, in particular objects made for and made by children," in connection with the overarching goals of the Victoria and Albert Museum and Collection (2013). The museum offers five small hands-on spaces in open areas adjacent to the exhibitions. The hands-on spaces include tables and chairs for art making, large plastic shapes for sitting and climbing, a stage area for performances, a sand pit, and the Sensory Pod, a small booth where colors are projected on the walls. Activities are offered free to visitors daily, including family tours, performances, hands-on art projects, and storytelling sessions. A schedule of daily activities is provided to visitors upon entry to the museum.

The Museum of Childhood focuses on "interactive looking" among visitors, encouraged primarily through prompts on labels inside the object cases (see Illustration 1). Icons on the labels alert visitors to the type of prompt, such as a magnifying glass signifying "search for…" and a star for "imagine…" The icons and labels also are color coded to ensure ease of use by visitors. Extended wall labels with questions to encourage discussion or inquiry, and wall signage with vocabulary terms related to childhood education, provide additional direction for "interactive looking." Both labels and signage are concise and written to ensure understanding among multi-generational audiences. The museum's emphasis on these prompts rather than hands-on objects or physical interactive components clearly identifies it as a museum about childhood rather than a museum predominantly for children.

Illustration 1. Museum of Childhood Interactive Looking Labels

The Museum of Childhood also showcased several participatory projects at the time of my visits. For one program, local artists were asked to make works of art in response to objects from the museum's collection. Another participatory project featured visitor comments about the exhibitions on object labels and wall signage. It was unclear how participants for these projects were selected. Additional visitor feedback is regularly gathered by staff via daily activities, and visitors also may provide feedback via the museum's website.

Case study at the Museum of Childhood: visitor comment displays.

The Museum of Childhood's visitor comment displays present a simple way for audiences to participate in the exhibitions. Visitor comments about specific objects or exhibitions are printed on color-coded labels, which are then displayed next to the object

in the case. The labels provide a direct connection between the objects on view and audience members. However, most of the comments chosen for display lack substantive information or reflection. For example, several labels merely state, "This [object] reminds me of my childhood," followed by the visitor's name. Other labels reference an object's characteristics, such as color or material, but do not include a description of what makes these characteristics interesting or valuable to the viewer. One comment, for instance, notes, "I love the bright colors on this [object]." In addition, no information is provided on how these visitors and comments are selected for display.

The concept of displaying visitor comments in the galleries is not new. Many museums have designated comment books or stations where visitors may record their thoughts and peruse comments made by others. The Museum of Childhood brings this feedback directly into the exhibition space by encouraging visitors to comment on specific objects and then displaying these comments on the object labels. The concept has significant potential to enrich the visitor experience and improve learning by inviting viewers to participate actively in the exhibition, assign their own meanings to the objects, and connect with the objects through the lens of their personal, prior experiences (Burnham and Kai-Kee 2011, 46). Incorporating visitor comments into the object labels exposes audiences to diverse perspectives that could not be created by staff alone, making the exhibition feel more authentic and memorable (Simon 2010, 203). Unfortunately, the insubstantial content of the comments chosen for display diminishes the project's capacity to engage viewers, who are "more likely to use extra interpretation only if it is appealing and relevant to them" (59). Interesting and relevant comments have the potential to elicit deeper inquiry and exploration of the artworks among viewers; in short,

more engaging comments lead to more engaged responses. The lack of information about how other visitors may contribute comments of their own also deters viewers from actively participating in an ongoing conversation about the objects on view.

Museum of London/Docklands

The Museum of London, Museum of London Docklands, and Museum of London Archaeology are three separate locations uniting the collective work of the Museum of London. The museum records, presents and explains the story of London from prehistory through the present day. The Docklands location specifically focuses on the history of London's river, port, and people. The mission of the Museum of London/Docklands is to "inspire a passion for London by communicating London's history, archaeology, and contemporary cultures to a wider world; reaching all of London's communities through playing a role in the debate about London; and facilitating and contributing to London-wide cultural and educational networks" (2013).

The museum's exhibitions are chronological, and interactive and participatory components, including opportunities for visitors to provide feedback, are integrated seamlessly into all exhibition spaces. Touchable replicas are displayed adjacent to original objects, with clear labels prompting visitors to explore specific characteristics of the object such as texture or material. Multiple games encourage visitors to guess the function of an artifact, search the galleries for specific objects, and answer questions about objects. Touch-screen computer kiosks in the galleries include games, quizzes, virtual tours of the exhibition space, comment prompts, and a searchable database of the museum's collection. A costume station adjacent to the exhibition space allows children to examine and wear historical clothes. Listening stations offer poetry, quotes by

historians or museum staff, and audio clips of historical speech and languages. Laminated print guides with information about the listening stations are also available. Film clips of objects being created or in use, without audio, are displayed in cases alongside the original artifact. “Mystery objects” are displayed in cases with prompts inviting visitors to guess the purpose of the object and write their responses on comment cards. A hands-on demonstration table is staffed by volunteers at select times (a print schedule is provided) and enables visitors to handle replicas and ask questions about the objects and exhibitions. Gallery guides printed on durable laminated sheets allow visitors to explore specific themes in one or several exhibition spaces. Reading benches are situated throughout the galleries near objects with extended print labels, and additional reading materials are available. An exhibition map and brochure is offered to visitors and notes that feedback may be provided via the museum’s website.

Case study at the Museum of London/Docklands: young adult response exhibition.

The Museum of London/Docklands presented a young adult response exhibition that was on display during my visits. For this exhibition, a group of 15-20 teens met with historians, educators, and museum staff members to discuss life in London in the 1700s and create a visual display about London’s sugar and slave trade at that time. The teens worked in groups to design large panels (approximately 1.5’ in width and 5’ in height) that were then displayed in the galleries that focused on the 1700s. The panels included the students’ personal reflections on the subject matter as well as historical images, artwork, poetry, photographs, and descriptions about the sugar and slave trades.

Vinyl signage on a gallery wall introduced visitors to the project and provided a brief description of the project activities. Additional wall text explained the museum's use—in both the teen-response exhibition as well as the larger exhibition spaces—of racially charged terminology related to the slave trades that was common in the 1700s but is considered offensive today (see Illustration 2). Some of this terminology was included on object labels and referenced in the teens' projects for historical accuracy, and the wall text provided a context for the use of this verbiage. There was no public information or signage on how the teens were selected to participate or whether the project was a one-time effort or an ongoing program coordinated by the museum.

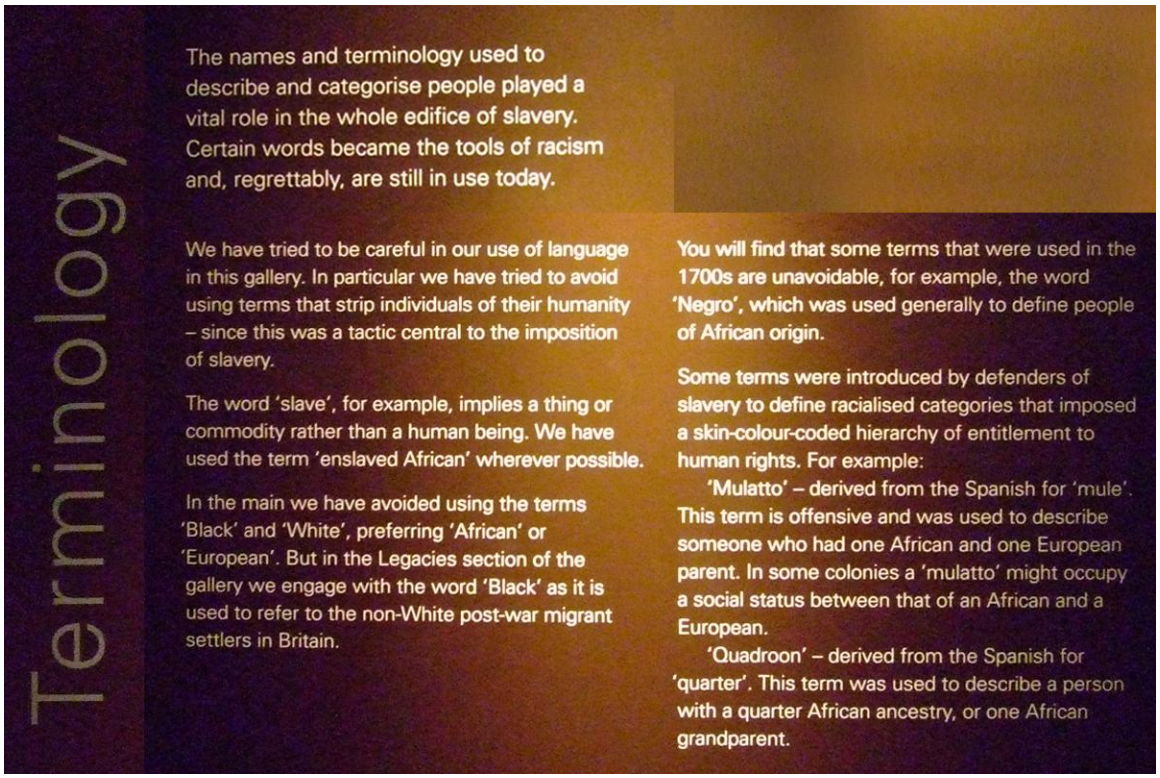

Illustration 2. Museum of London/Docklands Terminology Signage

The young adult response exhibition engages teen audiences with the museum and history through active participation. The project provides an opportunity for teens to

discuss sensitive historical topics with experts and museum staff members, create a visual display in response to these topics, and present their work in a professional museum setting. By inviting them to create and present content, the museum helps to validate the teens' abilities and empowers them to ask questions and offer their own interpretations, skills that are considered particularly important for 21st-century citizens (La Senna 2010). The project is an excellent example of the type of immersive, participatory experience that was cited in the *Learning Impact Research Project* as highly successful in stimulating learning among students (Hooper-Greenhill 2007). As with many of the experiences cited in the LIRP, the project does not offer a participatory experience for casual visitors, though the inclusion of the teens' work does provide visitors with a fresh perspective that lends greater relevance to the objects and subject matter (Simon 2010). Furthermore, the absence of information about the project's longevity (one-time project versus ongoing program) does not allow for an assessment of its long-term impact on potential teen participants.

Tate Modern

The mission of the Tate Modern is to "increase public knowledge, understanding, and enjoyment of British, modern, and contemporary art through the collection and an inspiring programme in and well beyond our galleries" (2013). Most of the Tate Modern's hands-on and interactive educational components are located in common, central areas of the museum but not in the exhibition spaces. Interactive components are placed at separate stations in the common areas.

Touch screen monitors include a searchable database of the museum's collection and digital maps of the galleries. Additional touch screen monitors allow visitors to

record themselves asking questions about the exhibitions, directed to the artists or other visitors, and watch filmed questions from other visitors or respond to a question. A comment station encourages visitors to leave feedback about the exhibitions and write responses on postcards that may be "posted" in a mailbox to museum staff members, which are then vetted by staff and pinned on a display board. Reading areas for adults and children include books related to the exhibitions and museum collection. Interactive computer games and quizzes accessed with touchscreen monitors are based on the museum collection and may be played by multiple visitors at one time. A space designated for children up to five years of age includes a slide, fort, and climbing activities based on a work of art in the collection. A small amphitheater space showcases short films related to the exhibition. Games, thematic printed guides, and other materials designed specifically for families are available for check out from the information desk upon request. These educational components are displayed in a large case in one of the museum's common areas.

The Tate Modern's only in-gallery interactive component is a multimedia guide on a smartphone device or ipod, which is available for check out from the information desk. The multimedia guide includes both film and audio clips in multiple languages, requiring users to look at the device screen more often than with an audio-only guide. At the time of my visits, this guide came under intense scrutiny in the London media (Thorpe 2011). Critics complained that visitors spent more time looking at the device than the original works of art on display and thus distracted visitors from making connections with the artworks, while supporters argued that the guide offered a more complete viewing experience by affording access to in-depth information about the

artworks. The controversy over the multimedia guide provided insight into both sides of the debate about the effectiveness of interactive educational components in museums, particularly art museums, where the traditional visitor experience is based almost entirely on the act of looking (Hooper-Greenhill 2007, 189).

Case study at the Tate Modern: children's merchandise.

The children's merchandise at the Tate Modern store is a unique example of interactive components that are not available to all visitors but have significant potential to impact learning among children and families. Specifically, the Tate Modern offers a memory game and study cards featuring artworks from the museum collection (see Illustration 3). Both the game and study cards include images of artworks, information about artists, and questions to encourage further discussion among users. The game and study cards are printed on thick, durable card stock or cardboard, and both products include artworks that are on permanent display in the museum galleries.

Illustration 3. Tate Art Collector Cards

These products appear to be ideal for the family check out program at the Tate Modern, and would enable families to play in the galleries and compare the information on the study cards to the original works of art. The products also further the museum's stated mission of providing educational programming beyond its physical galleries (Tate Modern 2013), since families may use the memory game and cards in home, daycare, or classroom settings. However, these products were not available for check out by families and only could be purchased in the museum store, significantly decreasing the potential user base for these learning materials. Because the game and study cards must be purchased, they may be considered as free-choice learning tools only for those visitors who are aware of their availability, consider them worthy of purchase, and can afford to buy them.

Victoria and Albert Museum (V&A)

The mission of the Victoria and Albert Museum is to "be the world's greatest museum of art and design and to enrich people's lives and inspire individuals and everyone in the creative industries, through the promotion of knowledge, understanding and enjoyment of the designed world" (2013). The V&A collection is international in scope and includes ceramics, glass, textiles, dress, silver, ironwork, jewelry, furniture, sculpture, paintings, prints, and photographs dating from ancient times to the present day.

Multiple traditional, interactive and participatory learning opportunities are fully integrated throughout the V&A exhibition spaces. Computers with touchscreen monitors are dispersed throughout the museum and host interactive games, quizzes, a searchable database of the collection, guided thematic tours, and information about the V&A. Touchable replicas with clear signage are positioned next to original artifacts. Audio interviews with art and design experts are provided for select objects through a simple speaker located on the object case; no separate audio device such as a smartphone or ipod is required. Soundless film clips that show objects in use or portray delicate objects from different angles are also positioned throughout the galleries. Replicas of historical books and documents are printed on durable paper and placed near the original objects, enabling visitors to read and peruse the content of these fragile items. Labels on select objects pose a question to visitors, who may lift the label to reveal the answer. A small, in-gallery theater shows films related to the exhibitions at regular times (schedule posted at theater entrance). The V&A hosts a comprehensive backpack program for families, which may be checked out from the museum study center at all times. A feedback station in one gallery encourages visitors to respond to a specific question and "post" their written

answer to museum staff. Comments are typed by staff and displayed in a book that visitors may read. Visitors also may provide feedback via any of the computers in the gallery or online.

The V&A also has areas outside of the exhibition spaces specifically designated for hands-on and interactive learning. The study center, located near the entrance to the museum, includes seating areas with books and computers that host a searchable database of the collection and visitor comment prompts. The discovery area, which is adjacent to the British exhibition spaces, has several hands-on stations enabling visitors to build an architectural model, try on costumes, and create artwork. Vinyl wall signage provides clear instructions for each station and encourages visitors to relate the activities to the objects on display. The V&A also hosts a working artist studio in the ceramics exhibition, allowing visitors to observe a ceramicist at work and examine ceramic works at different stages of development. Drawers located under touchable sample cases in the space adjacent to the artist studio contain hands-on activities related to the process of creating ceramics objects.

Case study at the V&A: computers with touchscreen monitors.

The computers with touchscreen monitors located throughout the V&A galleries create multiple pathways for visitors to interact with and learn about the objects on display. The computers include a variety of games related to the exhibitions and collection, such as matching games and puzzles. All games have scalable difficulty levels so that visitors of different ages and abilities may select the best option. Quizzes about the collection and exhibitions are formatted as games, keeping score of correct answers. Games and other activities on the computers are organized thematically so that visitors

may choose to learn more about objects and exhibitions of their own interest. For example, visitors may design their own textile, based on the museum's textile collection, and email or print the design in the study center. In the print exhibition, the computer kiosk includes a list of prints and photographs selected by community members including historians, art directors, musicians, students, journalists, writers, and prior visitors. Visitors may click on the artworks to read or listen to comments by the community members discussing their personal selections. A virtual tour of the exhibition space highlights these artworks and accompanies the comments by community members (see Illustration 4).

Illustration 4. V&A Computer Screenshots

Visitors also may respond to a multiple-choice question that requests their opinions about an object or exhibition and then displays the percentage of users who

chose each answer. In addition, visitors may post comments and read those from other viewers. The computers enable visitors to access a searchable database of the V&A collection and gather more information about the objects on display, or magnify images of objects to see details that may not be observable in person. Film and audio clips are also available on the computers. Finally, the V&A website is accessible from all of the computers in the galleries and study center.

The computer stations provide a wide variety of interactive components to foster personalized engagement with the V&A's exhibitions and collections. The computers may be used by visitors of all ages, knowledge levels, and abilities. Thus, the computer stations permit each user "to seek the level of engagement and understanding appropriate for the individual" (Falk 2009, 152), and retain choice and control over what content they consume—the essence of successful free-choice learning opportunities (142). Because the computers are integrated into the gallery spaces, viewers have the option of searching for in-depth information about specific objects or exhibitions without interrupting their chosen path through the museum. The placement of the computers in the galleries also encourages more frequent use by visitors. The computers are located at natural resting places where one display transitions to another, and most often are positioned next to specific objects referenced in the computer program. The inclusion of feedback and comment platforms gives visitors a sense of having contributed their own interpretations and ideas to the body of information available for public consumption. All components of the computers are designed to maximize learning, inviting visitors to "form their own interpretations, ask and pursue their own questions, and find personal relevance" in the museum's exhibitions and programs (Burnham and Kai-Kee 2011, 46).

Comparison of research findings.

While the five London museums integrated a number of similar free-choice interactive and participatory learning components into their galleries, I was struck by their different approaches to interactive and in-gallery learning at each museum. For example, the Tate Modern focused on cutting-edge technology, exemplified by the video comment stations, computer games, film amphitheater, and multi-media guide. However, the Tate Modern's hands-on interactive components were restricted to non-exhibition spaces that targeted children rather than multigenerational audiences. On each of my visits, I observed large groups of children in these common spaces and very few children in the exhibitions, an unfortunately common pattern in art museums considering that families comprise nearly 40% of art museum visitors (Brown 2008, 6). The integration of more family-based interactive components in the exhibitions could encourage children to spend more time exploring the original works of art in the galleries.

In contrast, the V&A and Museum of London/Docklands provided the most diverse range of in-gallery interactive and participatory opportunities, ranging from technology-based components at computer kiosks to touchable replicas, costumes, and interpretive components requiring physical manipulation. Both museums have extensive exhibition spaces with hundreds, if not thousands, of objects on display, enabling the development of an ample array of free-choice learning components. Despite this correlation, the Museum of London/Docklands exhibition spaces and artifacts often seemed overwhelmed by the learning components, particularly where several computers, reading stations, and hands-on components were grouped together.

The learning components in the V&A exhibition spaces seemed exceptionally well-placed so as to enhance, rather than eclipse, the visitors' experience with the original objects on view. The V&A also relied less on extended object labels and printed reading materials than the other museums, keeping signage and instructions concise and minimal. This strategy may have helped lessen the sense of being inundated with multiple interpretive components, which I experienced at the Museum of London/Docklands.

Like the V&A and Museum of London/Docklands, the British Museum had several well-developed interactive components, including the audio tours, touchable samples, and backpack program. However, the British Museum focused more heavily on traditional didactics including extended object labels, brochures, and printed maps and diagrams. The British Museum also provided interactive computers only in a study center separated from the exhibition spaces, with an emphasis on use of the computers for in-depth research into the museum's collection. This approach may reflect the British Museum's historical role as an academic research center aligned with the British Library and Archives.

The Museum of Childhood surprised me the most in its approach to in-gallery educational components. Where I expected exhibition spaces saturated with hands-on components for children, I instead found a focus on discussion and conversation prompted through questions and icons printed on object labels. Questioning or inquiry-based strategies are crucial components of interactive learning (Burnham and Kai-Kee 2011, 46), and the Museum of Childhood's use of these strategies was masterful. On each visit I spent considerable time listening to other visitors recount their childhood memories, wonder at the progress of civilization, share stories, and discuss the power of

imagination. The separate hands-on spaces for children, while heavily used, did not generate the same degree and quality of multigenerational dialogue as prompted by the simple questions posed on object labels.

CHAPTER FOUR

Implementation at the Boise Art Museum (BAM)

Based on a thorough review of best practices in museum education, the in-depth research at five London museums, and past experiences as a museum educator, I developed and implemented a range of in-gallery, interactive, and participatory educational components at the Boise Art Museum (see Appendix B). These interactive components were designed to transform the traditional, passive viewing experience into an active or participatory experience in order to improve learning among visitors.

The interactive components were integrated into four contiguous exhibition spaces: two galleries with high ceilings that accommodate large two- and three-dimensional works in 2,800 square feet of space, and two adjoining galleries of 1,800 square feet that provide a more intimate viewing area well suited for the display of small and mid-size artworks. The interactive components were developed in conjunction with two consecutive, year-long exhibitions featuring artworks from the Museum's permanent collection: *Eastern Traditions – Western Expressions,* which presented historic and contemporary Asian and Asian-American artworks, juxtaposing traditional and present-day forms, themes, and styles in a variety of media; and *Origins: Objects of Material Culture,* which showed ethnographic objects by communities in Africa, Oceania, and North America, spanning the time periods from pre-European contact through the 20th century. The use of the permanent collection was critical to the project, as copyright

permissions were required for many of the artworks featured in the new educational components, particularly the computer-based games and printed materials.

Integrated, Free-Choice Interactive and Participatory Components

I worked with BAM staff, a computer programmer, professional photographer, and graphic designer to create eight free-choice, interactive and participatory educational components for use directly in the exhibition spaces. I specifically developed a selection of educational components to engage many types of visitors, recognizing that not every educational component will appeal to every visitor (Falk 2009; Wilkening and Chung 2009). With diverse visitor identities in mind, I developed and implemented components that could be used in groups or individually, and that invited different levels of auditory, visual, or tactile interaction. I also was mindful of the logistics involved in implementing and maintaining the components. As a small to mid-size museum, BAM does not have the same resources as a major museum such as the V&A to support extensive technology and staffing expenditures in continuous updating of dozens of interactive educational components. It was necessary to strategically identify which components I observed at the five London museums that would appeal to visitors and could be modified to meet BAM's budgetary and staff capacity.

Sensory Station.

The Sensory Station at BAM represents a combination of computer, audio, and film components from the Tate Modern, V&A, and Museum of London/Docklands. The Sensory Station is a custom-built pedestal housing a 19" LCD touchscreen display connected to a secure computer, with seating and two sets of full-cover headphones (see

Illustration 5). The Sensory Station includes film and audio clips related to the exhibition, as well as computer games and a "research desk" module with detailed information about a selection of the artworks on view. The audio and film clips, based on the listening stations at the Museum of London/Docklands and V&A, include traditional Chinese and African music, African mask dances, a film of a Japanese tea ceremony, and a haiku reading (among other options), presented with on-screen images of artworks and information about the ways in which the clips relate to the exhibitions.

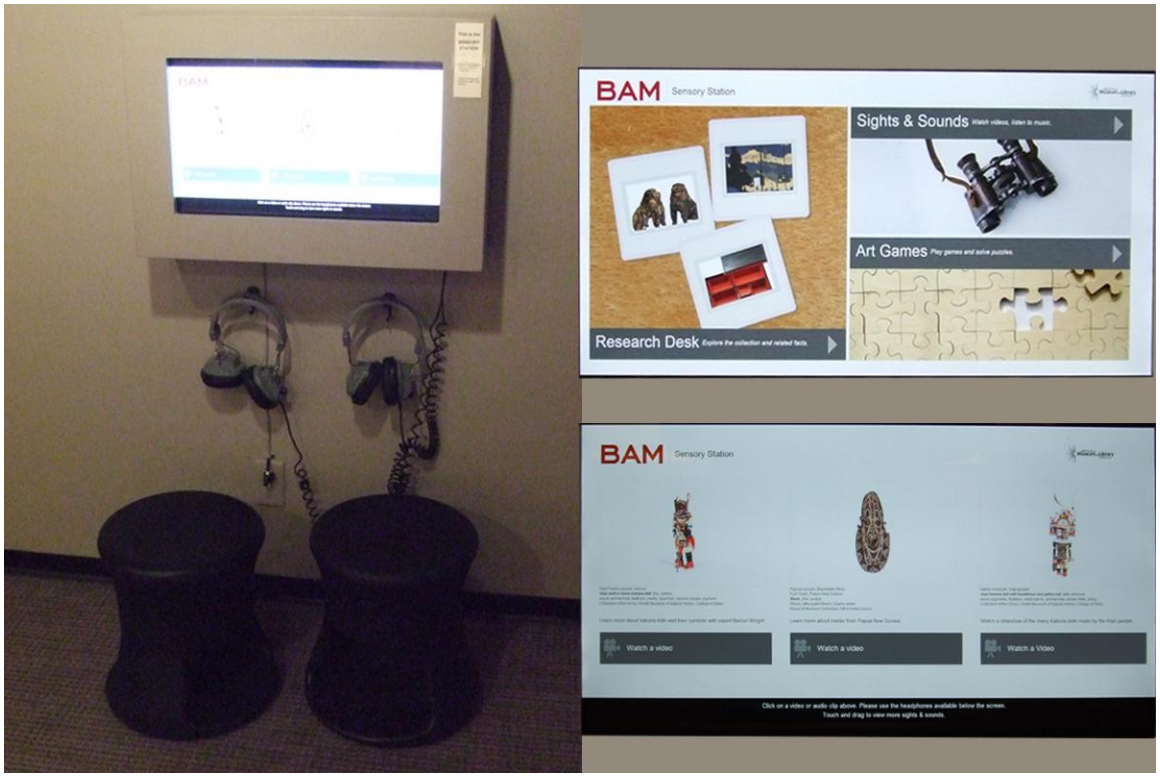

Illustration 5. Sensory Station and Screenshots

The art games, drawing from examples at the Museum of London/Docklands, Tate Modern, and V&A, include a matching game, digital jigsaw puzzles, and a game in which the user locates differences between two images of an artwork. The games have scalable difficulty levels to ensure usability by visitors of different ages. The successful

completion of a game brings up a screen with additional information or anecdotes about the featured artworks. The research desk, resembling a searchable "mini-database" of the collection such as those at the Tate Modern and V&A, provides in-depth information about select artworks in the exhibition, including connections to places, popular culture, and art techniques and movements. The Sensory Station also responds to the changing demographics of visitors, who are increasingly seeking to interact with museums through technology (Newman 2010, 5).

Virtual Curator.

The Virtual Curator program at BAM, residing on a custom-built pedestal and 19" LCD touchscreen display connected to a secure computer, was installed in a different gallery than the Sensory Station. At the Virtual Curator station, visitors may select works of art and arrange them in a digital display case that resembles an actual display case in the gallery (see Illustration 6).

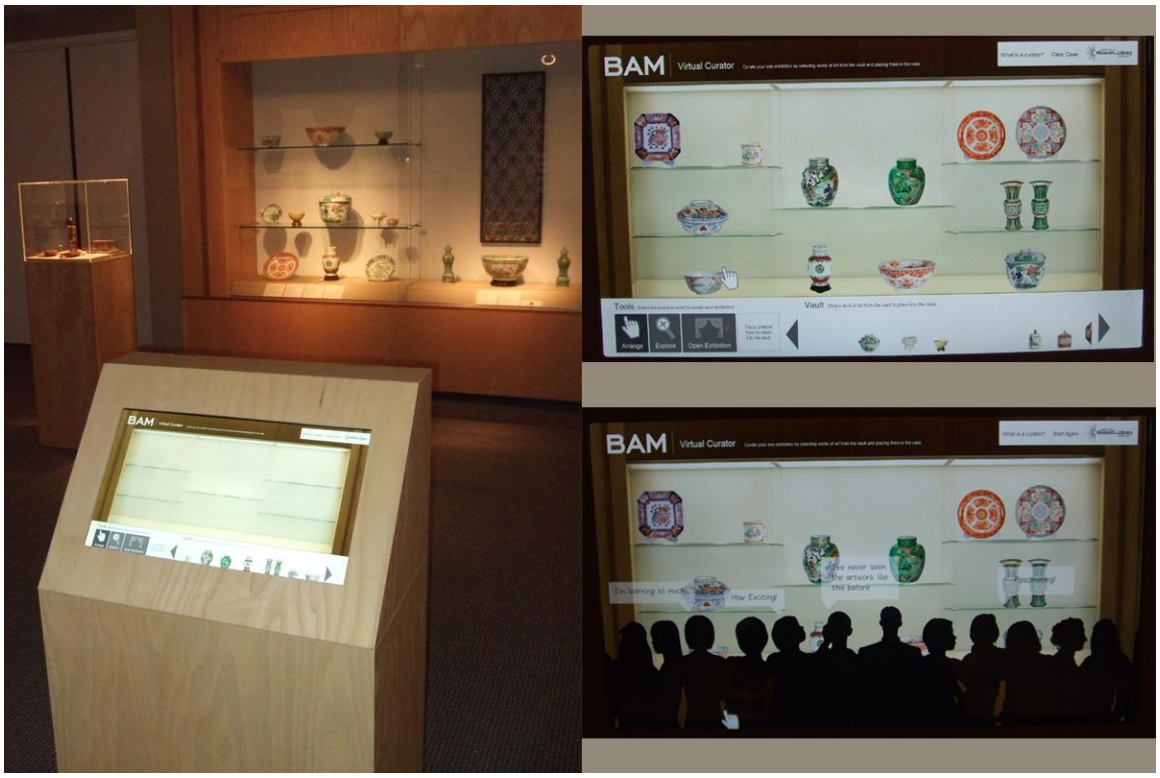

Illustration 6. Virtual Curator Kiosk and Screenshots,
Eastern Traditions – Western Expressions

High-resolution images enable users to zoom in and study the minute details of the artworks. Users also may read additional information about the artworks by tapping an "explore" button, and they may "open" their exhibition once they have finished arranging the artworks. The station includes images of artworks on display in the exhibitions, as well as additional works in BAM's collection that were not on view in the galleries. The Virtual Curator program provides an avenue for viewers to actively engage in the curatorial process, and learn more about both the objects on view and in the museum's collection.

The Virtual Curator stems from a project I previously conducted in BAM's ARTexperience Gallery, an interactive space designed specifically for children ages 12 and younger accompanied by an adult. In this space, visitors were invited to arrange

laminated images of artworks on pegs mounted to a wall that was painted with the outlines of a case, shelf, and pedestal. The ability to zoom in and examine details of artworks was based on the searchable collection database at the V&A.

Visitor Voices.

The Visitor Voices station was inspired largely by the comment and feedback features on the in-gallery computers at the V&A. Visitor Voices includes two computers and LCD monitors in an alcove directly adjacent to the exhibition space (see Illustration 7). At this station, visitors may create a digital postcard using art elements on view in the exhibitions and send it to friends or family via a secure internet connection, vote for their favorite response to a fun question about the exhibitions, provide direct feedback to BAM staff, and take a survey about their experience in the exhibitions. Visitor comments are vetted by staff and then posted on the computer so that people may see how others have responded to the exhibitions. The Visitor Voices station encourages visitors to participate in the exhibition by developing personal responses to the artworks on view and contributing their ideas and opinions to the public body of information (Simon 2010). The active solicitation of comments also demonstrates to visitors that the museum is a place that welcomes ongoing feedback from its community.

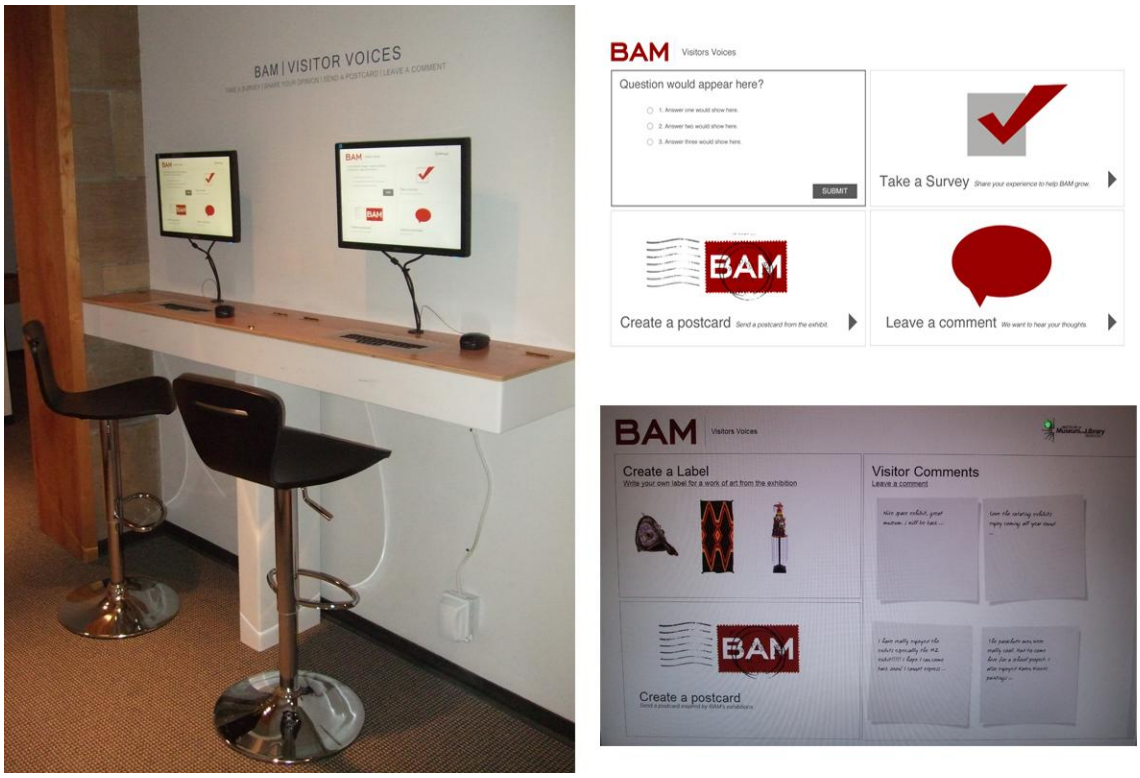

Illustration 7. Visitor Voices Station and Screenshots

Cell phone audio guide.

Audio guides have become staples of exhibitions at many museums and are popular interpretive activities among visitors (Wilkening and Chung 2009, 25). BAM has experimented with audio guides in the past, primarily available on devices checked out by patrons at the museum information desk, sometimes for a nominal fee. Based on my experiences with the audio and multimedia guides at the British Museum, Tate Modern, and V&A, I opted to create a free audio guide accessible via visitors' mobile phones (see Illustration 8). I specifically decided not to create a multimedia guide with both audio and film features, as at the Tate Modern, considering the many critiques of this component as being a distraction from the original artworks on display. Instead, I engaged artists, art experts, historians, art collectors, costume designers, educators, and museum staff to

write and record the audio guide segments. This concept was inspired by object labels at the Museum of London/Docklands, and audio interviews and the virtual tour at the V&A, which featured comments from museum staff, experts, and community members. By incorporating these voices into the cell phone audio guide, visitors are exposed to multiple perspectives on the works of art and have the opportunity to connect with artists, experts, and other members of the community (McLean and Pollock 2007; Simon 2010).

Illustration 8. Cell Phone Audio Guide

Family Activity Packs.

I created Family Activity Packs based on the comprehensive backpack programs offered at the British Museum and the V&A, as well as art museum studies showing that "families spend the majority of time on family-based events or programmes, with less time spent exploring the galleries" (Adams, Luke, and Ancelet 2010, 22). Family Activity

Packs include a variety of family-oriented activities and may be checked out at the BAM information desk on weekends and designated family days by visitors to guide their experiences in the exhibitions (see Illustration 9).

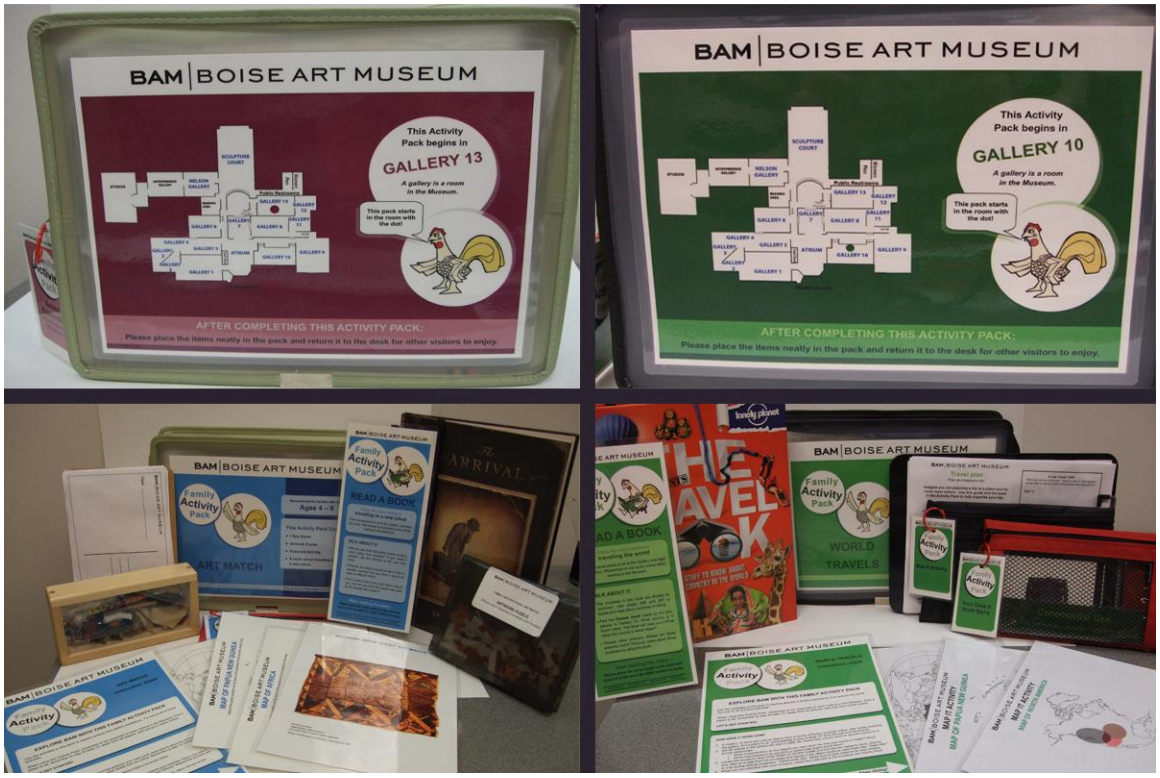

Illustration 9. Family Activity Packs

As at the British Museum, an adult ID card is exchanged for the Family Activity Pack to ensure that materials are returned at the end of the visit. I created six Family Activity Packs for each exhibition (see Table 2), focusing on specific themes, and recommended for certain age groups, though visitors of all ages (including adults) are welcome to use the packs. Each Family Activity Pack includes games, scavenger hunts, suggested topics for discussion, inquiry prompts, hands-on activities, a children's book, and a variety of other tools such as magnifying glasses, magnets and magnet boards, and

vocabulary lists, to help families engage with and learn about the artworks in the exhibition.

Table 2. Family Activity Packs at BAM

Family Activity Packs at BAM		
Ages	*Eastern Traditions – Western Expressions*	*Origins: Objects of Material Culture*
4-7	Colors and Shapes	Play with Pattern
	Matching	Animal Exploration
	Animals	Art Match
7-12	East and West	Discovering Symbols
	Poetry	Tell a Story
	Stories	World Travels

"In My Words" labels and family cell phone audio guide.

For the "In My Words" labels and family cell phone audio guide, I invited students ages 8-11 from a local primary school to create thoughtful written responses to works of art in the exhibitions (see Illustration 10). This component was inspired by the visitor comments on labels at the Museum of Childhood as well as the teen response exhibition at the Museum of London/Docklands. I invited students to attend a daylong workshop at which they toured the exhibition with BAM educators and learned how to compose creative responses to artworks of their choice. Their responses could be fictional stories or poems, a factual statement based on research, or a personal opinion about the artwork. The students also learned about the process of making labels for artworks in an exhibition, and typed and formatted their responses accordingly. The students' responses were mounted next to the artworks and the museum's existing labels, providing viewers

with a unique perspective on the works of art in the exhibition and encouraging them to make their own connections to the artworks (Simon 2010). BAM also recorded some of the students reading their labels for a family audio guide as an extension of the free cell phone audio guide.

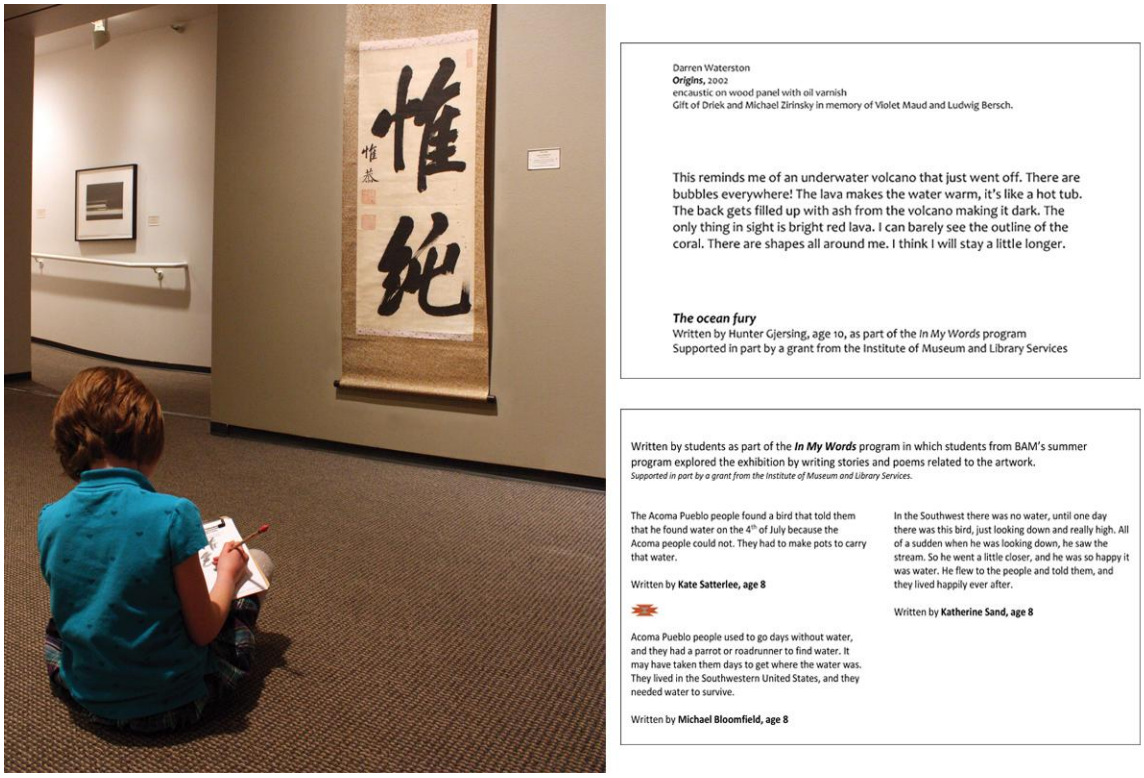

Illustration 10. In My Words Workshop and Labels

Art Cards.

I developed four thematic decks of art flashcards (see Illustration 11) based on the children's merchandise at the Tate Modern. The decks feature works of art from the exhibitions, *Eastern Traditions / Western Expressions* and *Origins: Objects of Material Culture,* as well as additional artworks from the museum's permanent collection. The artworks represent a range of media including paintings, sculpture, prints, ceramics, fiber art, masks, and glass. The front of each card includes a color image of the artwork. The

back of each card contains information about the artwork including artist, date, medium, and dimensions, as well as a brief biography of the artist or the culture that produced the artwork. Underneath the biography, an icon directs users to look for specific characteristics in the artwork, followed by three questions to guide further discussion or contemplation. The flashcards combine traditional didactic content with open-ended inquiry techniques, enabling users to generate personal responses to the objects and direct their own learning (Hooper-Greenhill 2007).

Illustration 11. BAM Art Cards

Each deck of Art Cards is based on a theme: "Second Nature," concerning nature in art; "True Colors," which explores colors and shapes; "In Your Element," focusing on the four elements of water, earth, air, and fire; and "The Whole Story," about stories or narratives in art. Each deck includes 18 art flashcards as well as an instruction card with

suggestions for using the flashcards to play learning games, which are designed specifically for the deck's theme and promote group discussion and interaction. A flap on the inside of the deck's box directs users to BAM's website, where families may register to receive a bonus art flashcard. Both children and adults may use the cards. Younger children may require reading assistance. The art flashcards are available for visitors to purchase in the BAM Store and additionally are used by BAM educators for select educational programs.

Discovery Guides.

For the *Origins* exhibition, I developed two thematic Discovery Guides based on the thematic tours at the British Museum and Museum of London/Docklands. I also developed the guides based on research showing that "museum fatigue" often results from large-scale exhibitions because visitors do not have the energy or attention span to see so many objects (Whitaker 2009, 174). The *Origins* exhibition included more than 250 objects, compared to less than 150 on view in *Eastern Traditions – Western Expressions*. Each Discovery Guide consists of a full-page laminated sheet directing visitors to specific artworks on view in the galleries (see Illustration 12). Visitors are encouraged to explore relationships between the artworks, whether through media, subject matter, color, or style. The "Sal's Picks" Discovery Guide primarily targets children and families, though the guide is available for all visitors. This guide features "Sal," the BAM Family mascot and guide to family learning, leading users on a tour of his favorite artworks in the exhibition. For each work of art, Sal poses open-ended questions to support critical thinking and generate discussion among family groups. The "Highlights" Discovery Guide directs visitors to one work of art in each area of the

exhibition. This guide encourages visitors to use the research desk on the touchscreen in-gallery computer to find more information about the artworks on view.

Illustration 12. Discovery Guides

Assessment Methodologies

The extended timelines of the exhibitions allowed for significant testing of the interactive components and an in-depth assessment of the impact on visitor learning. With guidance from professional evaluation consultant Wendy Meluch, who specializes in conducting visitor studies for museums, and using methodologies championed by Beverly Serrell, I developed a formal procedure to determine the success of the new educational components in transforming the traditional viewing experience into an interactive or participatory learning experience. Evaluation activities included timed

observations of visitors in the galleries, randomly collected exit surveys, and visitor usage statistics and feedback from the interactive computer-based components.

Timed Observations.

Timed observations involve discreetly following a randomly selected visitor through the exhibition and recording the visitor's behavior (Serrell 1998). A trained observer tracks the path of the visitor through the exhibition, records the exit and entry times, notes where the visitor stops in the exhibition and for how long, and tracks which interactive educational components are used by the visitor (see Appendix C). This process provides information about the clarity of visual signage directing visitors through the exhibition, the popularity of educational components, and audience behavior. I recorded a minimum of 50 timed observations over a period of five months for each exhibition to ensure statistical viability.

Exit Surveys.

With assistance from Ms. Meluch, I developed a one-page exit survey to gain information about visitor demographics and assess visitor learning (see Appendix C). The survey gathers basic data including age, gender, whether the visitor is part of a group, and whether the visitor is a BAM member or has previously been to the museum. The survey also asks the visitor to briefly describe the main purpose of the exhibition, provide one new idea that the exhibition inspired, note which interactive components were used, assess the quality of the interactive components, and identify a highlight of the exhibition. The exit survey provides quantitative and qualitative data about visitors' experiences and enables BAM to gather feedback about whether or not the exhibition and

educational components meet visitor expectations. I collected a minimum of 100 random-sample exit surveys over a period of five months for each exhibition to ensure statistical viability.

Visitor Usage Statistics and Feedback.

The interactive, technology-based educational components include a management system that allows BAM to track the number of users for each station, the time each user spends at a particular station, and the time each user spends on a specific activity at a station (for example, playing games). The management system also gathers feedback from the Visitor Voices comments sections and surveys. This data provides another layer of information about the ways in which visitors are using the interactive components and experiencing the exhibition.

Findings

Upon completion of the exhibition, *Eastern Traditions – Western Expressions*, I conducted an analysis of the data gathered to determine the success of the educational components in engaging visitors through interactive or participatory learning and increasing audience understanding and appreciation of the artworks on view. The exit survey revealed that 30% of respondents used one or more of the new educational components, with the Virtual Curator and cell phone audio guide receiving the highest number of "hits" according to usage statistics. Timed observations showed a slightly lower proportion of visitors using the new educational components at 25%. The cell phone audio guide received high marks from exit survey respondents, and many took time to note that they enjoyed hearing from the artists and experts on the audio guide.

Visitors also enjoyed reading the In My Words labels created by children and expressed that this component provided a welcome alternate viewpoint about the artworks and exhibition. The Family Activity Packs were checked out 122 times. Factoring in the number of weekends that the Family Activity Packs were available, an average of 4 packs were used each weekend. Reviews of the packs were overwhelmingly positive. This feedback corresponded to the fact that visitors using the packs spent an average of 50 minutes in the exhibition, a significant amount of time considering that timed observations revealed an average of 22 minutes spent in the exhibition per adult visitor. The Art Cards were not available for *Eastern Traditions – Western Expressions.* Due to the extensive time required for copyright requests, permissions and printing, BAM had originally planned to have the Art Cards available during the second exhibition and not for the first exhibition. Therefore, no data on their use was gathered during *Eastern Traditions – Western Expressions*.

More than 90% of survey respondents who used the interactive and participatory components felt that these new educational tools enhanced their visit and provided new ways of learning about the artworks. On the surveys, these respondents referenced specific artworks and content featured in the new educational components, including content that was not accessible through traditional object labels or signage. This feedback indicated that the new components positively impacted visitor learning.

The data gathered and reviewed after *Eastern Traditions – Western Expressions* led me to make a number of changes and improvements to the educational components prior to the opening of the exhibition, *Origins: Objects of Material Culture*. For example, data from the timed observations and exit surveys showed that visitor engagement via the

new interactive educational components had been impacted by a lack of signage explaining their purpose, and by their location within the gallery space. More than one-quarter of survey respondents noted that they did not see the Sensory Station, while 20% didn't see the Virtual Curator and 12% did not see signage related to the cell phone audio guide. Families who read about the Family Activity Packs on an exhibition handout expressed disappointment that the packs could be checked out only on weekends. Visitors were confused by the family cell phone audio guide that featured children's recordings, mistaking the children for museum staff or experts. Furthermore, many adult respondents noted that they thought the interactive components, particularly the Sensory Station, Virtual Curator, and Visitor Voices station, were only for children.

Visitor usage statistics also showed that visitors spent much more time at the Sensory Station than the Virtual Curator and Visitor Voices station. This discrepancy was due in part to the comparatively larger amount of activities and content on the Sensory Station: three different games at varying levels of difficulty, multiple audio and film clips, and in-depth research on a number of artworks in the exhibition. Some visitors did not use the Sensory Station primarily because it was in use by other people during their entire visit.

In response to this feedback, I altered the content of the Sensory Station for the *Origins* exhibition. I moved the games to another touchscreen computer in the museum's ARTexperience Gallery (see Illustration 13) and also placed them on the BAM website. I also moved the research desk component to its own touchscreen display and secure computer in BAM's Community Connections Gallery, which has seating, books, and other informational resources for visitors. These changes reduced the number of activities

on the Sensory Station and provided a new interactive computer station, the Research Desk, in another gallery (see Illustration 14). For *Origins*, I also worked with the museum's curatorial staff to place the Sensory Station in a different location, moving it from a dimly lit back corner to a wall by the gallery entrance. I worked with the graphic designer and museum staff to create clearer signage for the cell phone audio guide, including larger and darker icons on the object labels as well as a large icon and instructions on the exhibition title wall.

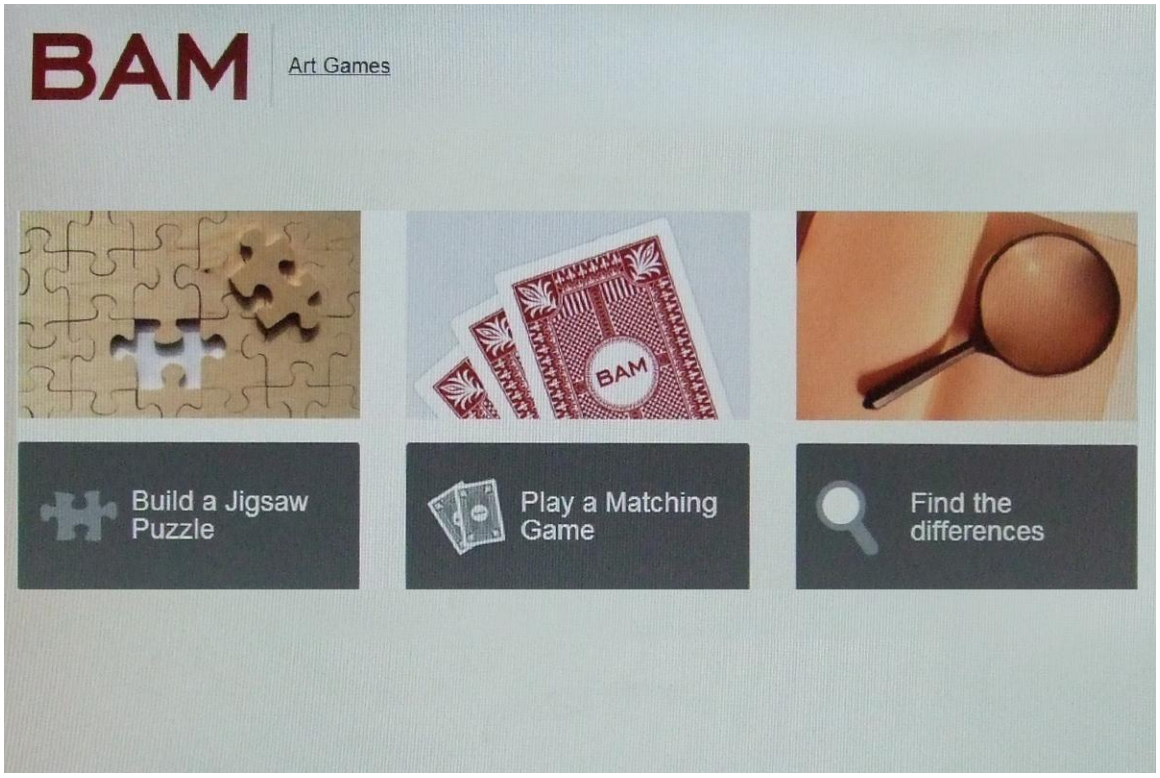

Illustration 13. Art Games Screenshot

Illustration 14. Research Desk Location and Screenshots

I eliminated the family component of the cell phone audio guide, so that the children's responses were featured only on the printed In My Words labels. Family Activity Packs were made available for check out during the week, and BAM visitor services volunteers also were trained to inform visitors about the interactive and participatory components in the exhibition. I also developed the Discovery Guides for the *Origins* exhibition, which featured a much larger number of objects than *Eastern Traditions – Western Expressions* and thus could potentially overwhelm visitors.

Data compiled during *Origins: Objects of Material Culture* revealed changes in usage of the interactive and participatory components as a result of these changes. Among survey respondents, 37% used one or more of the new educational components, while 32% of visitors tracked through timed observations used one or more of the

components. Approximately 20% of visitors observed used the Sensory Station and/or the Virtual Curator, while 12% used the Visitor Voices station. Oddly enough, use of the Family Activity Packs decreased by approximately 50%, despite the fact that they were available everyday rather than only on weekends. Use of the Family Activity Packs may have been impacted by the availability of the family-oriented Discovery Guide, which was heavily used, as well as the effectiveness of volunteers in promoting the packs (see Chapter 5 for further discussion). It should also be pointed out that nearly all survey respondents noticed each of the interactive and participatory components in the galleries, whether they used the tools or not. This data suggests that the revised location of the Sensory Station and improved signage for the cell phone audio guide contributed to the higher usage percentages among visitors to the *Origins* exhibition. Due to unforeseen difficulties securing copyright permissions, the Art Cards were not available during the *Origins* exhibition. As a result, no data on their use is available (see Chapter 5 for a discussion of the timeline for production of the art flashcards).

Once again, survey respondents gave overwhelmingly positive feedback concerning the educational components. The cell phone audio guide was mentioned most often as a successful educational tool, followed by the newly configured Sensory Station and Research Desk computer kiosks. The sample did contain several complaints about the Virtual Curator station not working correctly. This functionality issue was evident in timed observations as well, leading to continued maintenance of the Virtual Curator and adjustments to the sensitivity of the touchscreen monitor. However, the Virtual Curator also received strong praise from users, who often stated that they appreciated the ability to zoom in on minute details of the artworks. Visitors who checked out Family Activity

Packs also gave highly positive assessments, and spent an average time of 53 minutes in the exhibition.

Overall, the data shows that, cumulatively, approximately one-third of visitors to the exhibitions used one or more of the new educational components. An analysis of the data from timed observations reveals that visitors who used the interactive and participatory components spent an average of 16% (Visitor Voices) to 26% (Sensory Station) of their total time in the exhibitions using the computer-based tools (these figures are not available for Family Activity Packs or Discovery Guides, which were checked out upon entry to the exhibitions and checked out at the exit). Survey respondents who used the interactive and participatory components consistently referred to content available only through these components when referencing specific artworks and articulating memorable highlights of the exhibitions. This data suggests that the interactive components, when used, successfully engaged visitors and impacted learning.

CHAPTER FIVE

Reflections for the Future

The closing of the exhibition, *Origins: Objects of Material Culture,* represents the culmination of this three-year project to research, develop, and integrate free-choice, interactive and participatory educational components directly into the Boise Art Museum's exhibition spaces. The project was a valuable learning and professional experience. I learned much about the time, costs, and commitment required to implement interactive and participatory components into exhibition spaces. The in-depth evaluation provided a wealth of information on the behaviors of visitors to BAM and gave me considerable insight into the demands of the museum's audiences. Based on this data as well as my own observations, I will modify and refine the new components even further to ensure that they better serve BAM's visitors and impact their learning in the galleries.

Sensory Station

Removing the research desk and art games from the Sensory Station kiosk improved its functionality and allowed more visitors to experience film and audio clips related to the exhibition. The Sensory Station was one of the most popular new educational components for both exhibitions, and its improved placement in the gallery for *Origins* resulted in increased usage among visitors. Audiences enjoyed having access to films and interviews of artists, demonstrations of how objects are made and used, traditional or contemporary music, and historical context for objects or artistic

movements. This component may be easily adapted for changing exhibitions. A primary challenge is the technological expertise required to clip and embed the film and audio files into the Sensory Station programming. For this project, I outsourced the programming to a technical expert, which was time consuming and expensive. It will be important for BAM to increase its library of digital film and audio files for future use on the Sensory Station through purchase or in-house creation, and to include the costs for this work into future exhibition sponsorships and funding requests.

Research Desk

Originally a component of the Sensory Station, the Research Desk was moved to its own computer kiosk for *Origins.* The Research Desk includes more in-depth information about the artworks on display, as well as related artworks and images for comparison/contrast. The Research Desk successfully functioned as a mini-searchable database of artworks, but I felt it was underutilized. It should be noted that this component appeals only to visitors who are interested in and can commit time to reading extended information. However, I believe this component could be more effectively promoted to visitors. For example, signage on or near labels for objects featured on the Research Desk could direct visitors to the computer kiosk. Shorter timelines for loaned exhibitions, as well as image restrictions imposed by institutions and collectors of loaned artworks, suggest that this component is more suitable for exhibitions of artworks from BAM's permanent collection. I will continue to add permanent collection images and information to the Research Desk, and develop a database in which objects may be selected or de-selected according to whether or not they are on view.

Art Games

Like the Research Desk, the Art Games were moved from the Sensory Station to another computer following the *Eastern Traditions – Western Expressions* exhibition. The games primarily attracted children, and thus I relocated this computer to BAM's ARTexperience Gallery. It should also be noted that many visitors observed children playing the games and then concluded that the station was not intended for adults. This perception will be addressed by new signage near the kiosk encouraging all visitors to play the games. I believe that further testing and development could lead to the creation of games more suitable for multigenerational audiences, though this would be a lengthy and costly process. I may pursue the development of new games should the funding become available. The current games, featuring different artworks, will continue to be available in its new location.

I also moved the games to a section of the BAM website titled "BAM Kids." Because the games are available on the website, I am concerned that visitors will not be motivated to play the same games in the gallery. Thus, I plan to remove several of the games from the website and feature only one game or activity as a teaser to encourage visitation and use of the Art Games station at BAM.

Virtual Curator

The Virtual Curator was highly popular among visitors, including both adults and children. Visitors enjoyed selecting artworks and moving them around in the virtual display, but usage statistics from the station showed that users did not access the in-depth information as often as I'd hoped. The intention was to help visitors understand how the curatorial process works—how artworks are selected and displayed—by accessing not

only the images but also information about the criteria used to curate an exhibition (whether culture, time period, color or theme). Most users spent little or no time reading this information. This may be due in part to the large number of images available on the Virtual Curator. I initially wanted to provide visitors with as many choices as possible, but it may be beneficial to reduce the number of images and create more scaffolding of the curatorial information. The large number of high-resolution images also contributed to functionality problems. The size of the images required so much memory that the computer often shut down midway through the user experience. In the future, I will reduce the number of images on the Virtual Curator and include information about the curatorial process directly on the station's start screen.

Another challenge with the Virtual Curator was its placement in the galleries. For *Eastern Traditions – Western Expressions,* the kiosk was placed in front of a case of objects. The design of the virtual display mimicked the cases, allowing visitors to make a direct comparison of their virtual exhibitions and the physical exhibition. For *Origins,* the kiosk was originally planned for a space facing multi-level platforms with multiple objects. Last-minute changes to the exhibition design meant that the kiosk was relegated to a position facing a wall. This location was less effective because only one large artwork was in front of the kiosk. This change meant that users could select and arrange only three images on a blank background in their virtual display (see Illustration 15). The kiosk will be returned to its original location in front of the cases for future exhibitions.

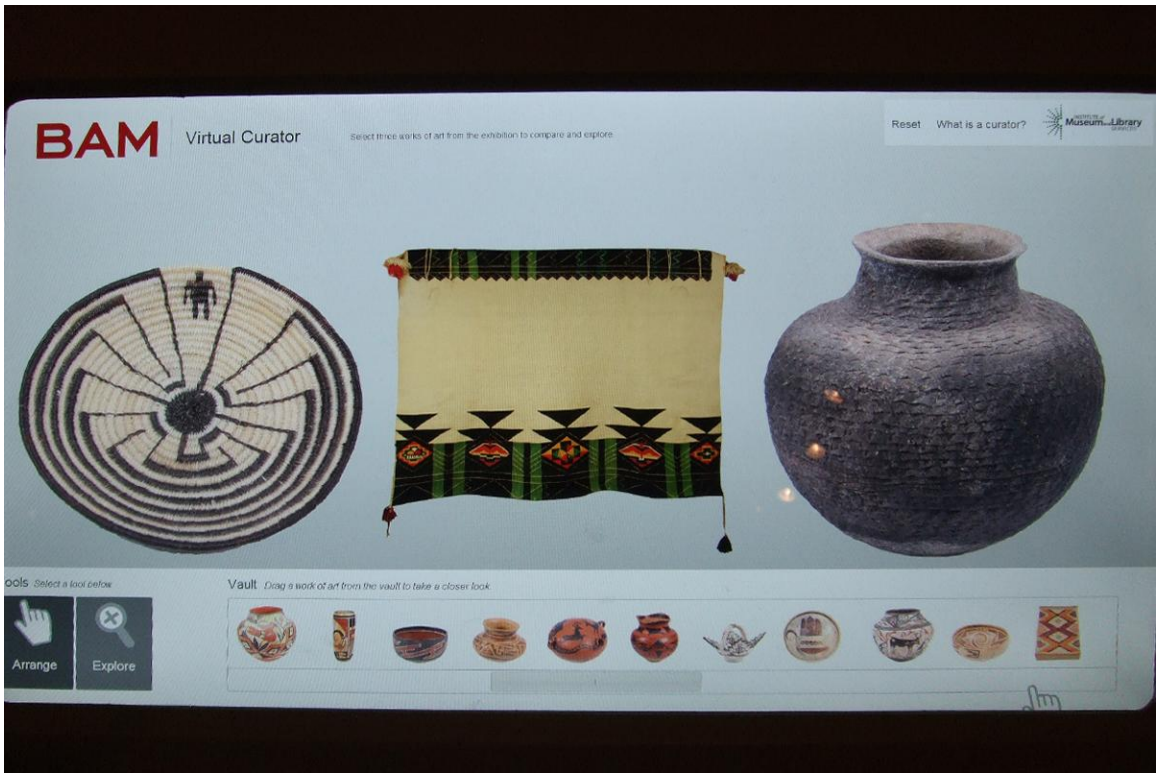

Illustration 15. Virtual Curator Screenshot, *Origins*

Visitor Voices

The Visitor Voices station was modeled after computers I researched in London, but I also based it on visitor comment books and physical voting stations that had been popular at BAM in the past. I hoped that audiences would enjoy providing feedback, designing and emailing digital postcards, and responding to questions and surveys. The station would enable visitors to add their own voices to the exhibition, and would also capture valuable information about BAM's audiences. However, evaluations showed that the Visitor Voices station was utilized less than the other new educational components.

An analysis of data from timed observations revealed that the location of the station was highly problematic. I placed the Visitor Voices station in an alcove at what staff believed would be the end point of the exhibitions. I anticipated that visitors would

view the exhibition, then exit directly adjacent to the alcove where they could record their comments and provide feedback about their experiences. This expectation was unfounded. Changing exhibitions in other galleries altered visitors' paths through the museum so that people were met with the Visitor Voices station *before* they entered the *Eastern Traditions – Western Expressions* or *Origins* exhibitions. The questions on the surveys relating to these exhibitions were not relevant at that point. Furthermore, a wall separated the Visitor Voices alcove from visitors entering the exhibitions through this backward pathway so that some visitors didn't see the computers at all. A bright paint color and contrasting signage would help ensure that visitors see the station, and more general questions that relate to artworks in multiple exhibitions would guarantee relevance regardless of a visitor's pathway. Eventually, it may be necessary to change the location of the Visitor Voices station entirely to increase visibility and access.

Another challenge with the Visitor Voices station is the museum's use of the information captured. Visitors enjoyed designing and emailing postcards, typing comments, and reading other visitors' comments because there was a clear social component to these activities. They could communicate with a friend by email, read other visitors' comments, and respond directly with their own comments. Users were less inclined to complete a survey because there was no public use of this information. This element did not capitalize on the social characteristic of participatory experiences and was less successful as a result (Simon 2010, 27). In the future, I will need to modify the survey to make it socially appealing to visitors and provide a direct explanation of how the museum will use that information to better engage with and serve its audiences.

Cell Phone Audio Guide

The cell phone audio guide was extremely popular among audiences. Because it is accessible via visitors' own phones, this component easily may be adapted for long-term and short-term exhibitions. The audio guide presented only one major challenge: using experts, artists, and collectors to record audio clips. Visitors appreciated hearing from these diverse voices on the guide, but it was difficult and time consuming to identify appropriate experts and guide them through the process of recording their segments.

BAM contracts with a professional company to host its cell phone audio guides. The company provides a simple interface for recording audio segments either by phone (similar to leaving a voice message) or by uploading a digital sound file. BAM has used the system to great effect in the past due to the ease of creating the recordings as well as the straightforward user interface. However, some of the artists and experts who created recordings for *Eastern Traditions – Western Expressions* used a poor phone connection, resulting in a low-quality recording. Other people digressed from the theme of the exhibition or provided too little information about the object, leading to confusion among listeners. For *Origins*, I worked with an undergraduate art history class at Boise State University to research, write, and record some of the audio segments. This process was more efficient for BAM staff, and the messaging on the audio guide was more consistent as a whole, but the diversity of voices provided by the artists and experts was missing. In the future, it will be necessary to strike a balance between these two approaches to create high quality audio guides. Perhaps a more detailed outline of what type of content should be recorded would assist artists and experts with creating more effective segments. I also

will include the audio guides as a podcast on BAM's website and the Sensory Station, so that visitors may access the information without a cell phone.

Family Activity Packs

The Family Activity Packs were highly successful, receiving overwhelmingly positive feedback from users. The activities were varied and appropriate for children of different ages, and encouraged families to spend more time in the exhibition spaces. However, inconsistent promotion of the Family Activity Packs by BAM's visitor services volunteers had a critical impact on their use. A few volunteers actively promoted the Packs to families who entered the museum, but most volunteers relied on a sign at the front desk stating, "Family Activity Packs available today" and did not ask visitors whether they would like to use the Packs. As a result, usage of the Family Activity Packs actually declined during the *Origins* exhibition, despite the fact that they were available daily and not solely on weekends as during *Eastern Traditions – Western Expressions*. More extensive and consistent volunteer training, and additional promotion of the Family Activity Packs on the BAM website and on in-gallery signage will help to address this problem.

Moving forward, a major challenge with the Family Activity Packs will be adapting them for shorter exhibitions. Staffing limitations prevent the continual development of new Family Activity Packs every few months, when exhibitions change. As a result, it may be necessary to selectively offer the Family Activity Packs for longer exhibitions. I am working to create more generalized Packs that do not reference specific exhibitions and may be used throughout the museum even as exhibitions change, but this may be difficult given that many of the activities must reference specific artworks.

In My Words Labels

The In My Words labels, though popular among visitors, were fraught with challenges from the beginning. Before *Eastern Traditions – Western Expressions,* it became apparent that the exhibition would have to open before the labels could be written because the selection of artworks for display was in constant flux almost until opening day. Once the exhibition opened, I could lead the children through the galleries and guide them in writing labels. The process was fairly successful for *Eastern Traditions – Western Expressions* because I partnered with an art teacher at a local school to invite students who were interested in participating. The students enjoyed the process and were extremely proud to have their labels on view in the museum. For *Origins,* I engaged students in one of BAM's summer camps to write the labels. Some of these students were not enthusiastic participants—they came to make art, not write! In both cases, the short timeline of the process (one day) meant that the students' responses were not as refined as they could have been. For the future, I hope to engage a class in a semester-long In My Labels project or possibly work with The Cabin's summer writers' programs (which visit the museum for writing projects annually). These partnerships would result in more successful labels and ensure a rewarding experience for the participants.

Art Cards

The Art Cards represent a great idea that has been extremely difficult to bring to fruition. I believe the idea of an educational product that can be used in the museum and at home has fantastic potential. Unfortunately, the process of procuring copyright permissions to use the images was far more time consuming and challenging than anticipated. As a result, the Art Cards did not become available until after the second

exhibition had closed. When it became apparent that the timeline would be extended, I decided to develop four packs of flashcards featuring artworks not only from the exhibitions but also artworks that related to particular themes from BAM's permanent collection, ensuring that the flashcards could be used into the future. The Art Cards will be used in future Family Activity Packs as well as BAM's monthly programs, teacher institutes, and docent training. Buyers who register their Art Cards with the BAM website will be encouraged to collect all four packs, and the website also will enable me to capture feedback from users.

I suggest a critical change to the way in which artworks are accessioned into BAM's permanent collection in order to make projects like this more efficient in the future. When an artwork is accessioned, the artist or owner should automatically be asked for permission to use images of the artwork for educational purposes and products. The permissions should be kept on file and noted in the accessions database. This simple addition to the accessioning process would eliminate the need to research copyrights, contact artists, and gather permission forms for every educational project using images, including the art games, BAM website, brochures, and gallery guides, as well as promotional materials and publications.

Discovery Guides

I developed the Discovery Guides largely due to the high number of objects in the *Origins* exhibition, where a mini-tour would be particularly helpful for visitors who might feel overwhelmed by so much to see (Whitaker 2009). The guides proved highly popular, so much so that visitors often took them home! This "appropriation" of the guides for use outside the museum led to the continual reprinting and re-laminating of

guides by staff, a time consuming and costly process. Upon reflection, the lack of extended labels or a more traditional didactic exhibition brochure may have contributed to the theft of the Discovery Guides. Many visitors still desire this more traditional vehicle for content retrieval, and there is also something highly satisfying about having this information literally in hand. This need must be taken into consideration for future exhibitions. It may be necessary to secure funding to produce a mass printing of the Discovery Guides, making them available for visitors to take with them, or to have laminated guides available for check out.

General Reflections

Overall, the results of this project support my belief that in-gallery, free-choice interactive and participatory educational components create more pathways for visitors to learn about artwork and lead to a more rewarding museum experience. The project created many options for audiences to engage with the artworks, and data from the formal evaluations suggests that the new components successfully impacted learning. There are some considerations that will influence the ways in which these types of learning opportunities are integrated into BAM's exhibitions in the future.

Including me, the Boise Art Museum has two full-time staff members in its education department. These two staff members are responsible for all of the museum's educational programming, including school tours, outreach, adult classes, monthly programs, events, demonstrations, summer camps and classes for children, community days, lectures, brochures, presentations, web content, and countless administrative duties. Many if not all of the museums I researched in London have dozens and dozens of education staff, including some staff members dedicated solely to the in-gallery

components. Needless to say, taking on a project of this magnitude was incredibly challenging for only two staff members. The time required to research content, secure image permissions, develop computer programs, design print materials, create the Family Activity Packs, write the Discovery Guides, and coordinate the In My Words labels and cell phone audio guides—all while maintaining the museum's regular educational programs—was overwhelming. I recruited interns from local colleges and universities to assist with the project, but these interns had unpredictable skills and schedules, and they could only help with certain tasks. Speaking to artists, editing final content, making design and budget decisions, purchasing materials, and creating contracts had to be done by staff.

Going forward, it will be necessary to evaluate every in-gallery component against the short- and long-term time commitment required by staff to create and maintain a high-quality experience for visitors. Furthermore, not every component need be included in every future exhibition. The Sensory Station may be well suited to an exhibition with historical objects or novel artistic processes, but less effective for site-specific installations. The Research Desk may be better suited for general information about artworks from the permanent collection, whether or not they are on view, and thus could be updated only once or twice a year. A careful assessment of the time requirements for each component will determine, in part, how often they are made available during exhibitions.

Cost also will play a significant role in the components' availability. The IMLS grant provided crucial support for the development of these components, but all have ongoing maintenance needs. Some components, such as the computer stations, required

outsourcing to programmers, photographers, and designers, a huge cost that is unsustainable without ongoing funding. In the future, BAM should consider whether it would be more cost effective to have a computer programmer on staff in order to support these components. Grant applications and sponsorship requests should routinely include the costs for in-gallery educational components, when appropriate.

The project also reinforced the need to continue providing traditional didactic elements for visitors. The new educational components were novel for many of BAM's visitors, who came expecting a traditional written handout or extended object labels. The needs of these visitors must be met even as the museum strives to engage different types of people in new ways. On average, museum staff members have observed that it takes at least three years before a new program truly takes hold among audiences. I suspect that some of the new in-gallery educational components will require even more time before visitors become fully accustomed to them. Additional promotion on the website, via social media, and through clear in-gallery signage will encourage people to try the components. Providing a balance between interactive or participatory components and traditional didactic materials will ensure that all visitors enjoy their experience at the museum.

Finally, extensive attention must be given to the interaction between the educational components of the exhibition and its curation and design. The traditional museum paradigm in which education and exhibition functions remain largely separate is not conducive to the implementation of effective in-gallery components. The education and exhibition teams must act in concert from the moment an exhibition is conceived until the moment it is de-installed. It is necessary for educational staff to have access to

high-quality images, final checklists, and the exhibition layout well in advance of the actual installation. Exhibition designers must have a complete understanding of the in-gallery interactive and participatory educational components proposed for an exhibition so that these may be incorporated into the layout and installation timeline. Curatorial and education staff must work together to secure image permissions, conduct research, and identify the themes and messages of the exhibition. Only when this work is conducted collaboratively and in advance will the integration of free-choice, interactive and participatory educational components into the museum's galleries become a seamless part of the museum experience.

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APPENDIX A

Chart of Free-Choice Educational Components at Five London Museums:

British Museum, Museum of Childhood, Museum of London/Docklands,

Tate Modern, and Victoria and Albert Museum

PHYSICAL						
Educational components classified as physical include hands-on activities, touchable objects, and dedicated interactive spaces (both within and outside of primary exhibition spaces). This category also includes interpretive components that physically enhance the exhibition spaces.		British	Childhood	London/Dock	Tate Modern	V&A
Activities (Check-out)	Backpack program Thematic backpacks that can be checked out by families for use in the galleries, including games, books, vocabulary lists, and other educational tools	x				x
	Children's merchandise Flashcards and other educational merchandise related to the museum collection				x	
Touchable Objects	Hands-on tables/stations Permanent or temporary tables in specific galleries at which trained volunteers facilitate hands-on experiences and demonstrations at regular times	x		x		x

PHYSICAL						
Educational components classified as physical include hands-on activities, touchable objects, and dedicated interactive spaces (both within and outside of primary exhibition spaces). This category also includes interpretive components that physically enhance the exhibition spaces.		British	Childhood	London/Dock	Tate Modern	V&A
	Touch tours Volunteer-guided tours for visually impaired visitors including stops at objects that can be touched	x				
	Hands-on activities/games Activities and games operated via physical manipulation, such as touching object replicas to guess the material or purpose, and using magnifying glasses or patterned overlays to explore documents and objects on display			x		
	Games with light-up answers Games consist of a large wooden box with questions and buttons next to answers; when the correct button is pressed the answer lights up			x		
	Costume activities Touchable/wearable costumes similar to textiles artifacts on display			x		
	Touchable replicas and samples Touchable replicas or samples adjacent to original objects on display, enabling visitors to examine material, texture, and surface of comparable objects (original objects are located in enclosed cases to ensure safety)	x		x		x
	Activities in drawers Drawers under touchable sample cases have hands-on activities related to ceramics processes					x

PHYSICAL						
Educational components classified as physical include hands-on activities, touchable objects, and dedicated interactive spaces (both within and outside of primary exhibition spaces). This category also includes interpretive components that physically enhance the exhibition spaces.		British	Childhood	London/Dock	Tate Modern	V&A
	Reprints of historic documents/books Books and documents are printed on durable paper and are available near the original object					x
	Braille icons, pull-out labels and touch tables Braille icons and colored labels on table holding touchable samples of objects and materials; some labels pull out from table			x		x
	Lift labels Labels pose questions related to a specific object; visitors find the answer by lifting the label					x
Enhanced Exhibition Components	Magnifying glasses in cases Large magnifying glasses mounted inside cases help visitors examine small objects	x				
	Related exhibitions Related exhibitions include artworks by local artists that respond to objects from the museum's collection, artworks by contemporary artists that complement a specific exhibition, artworks related to exhibition themes from a partnering organization, and displays created by teens in response to a theme		x	x		x
	Thematic cases and descriptions Cases of objects are arranged thematically with a description printed in vinyl on the outside of case		x			

PHYSICAL						
Educational components classified as physical include hands-on activities, touchable objects, and dedicated interactive spaces (both within and outside of primary exhibition spaces). This category also includes interpretive components that physically enhance the exhibition spaces.		British	Childhood	London/Dock	Tate Modern	V&A
	Multi-level displays Lower cases and signage for young visitors, including a gallery exploration trail			x		
	Mystery objects Unknown or curious objects are displayed with questions inviting visitor discussion			x		
	Family activities display Display case of the games, trails, and other materials available to families for check out				x	
	Work in progress display Display illustrating works in progress or the process of a particular technique					x
Dedicated Spaces	Library, research, or study center Library, research, or study center separate from exhibition spaces; centers include computers, books, and educational resources available for check out	x				x
	Reading benches and adult reading stations Reading benches near lengthy text panels and cases with many objects or extended object labels, or designated reading stations with books tethered to tables			x	x	
	Dedicated hands-on spaces Spaces within the exhibition space or in museum common spaces designated for hands-on activities, often targeting children; spaces				x	x

PHYSICAL						
Educational components classified as physical include hands-on activities, touchable objects, and dedicated interactive spaces (both within and outside of primary exhibition spaces). This category also includes interpretive components that physically enhance the exhibition spaces.		British	Childhood	London/Dock	Tate Modern	V&A
	may include both creative activities and play equipment					
	Low book table with mounted books Knee-height table with art books for children (books are mounted to clear plastic panels)				x	
	Working artist studio in gallery Ceramic artist in residence studio located in gallery; displays of finished/unfinished work on shelves					x

PRINTED						
Printed educational components rely on text for visitor usage or understanding and include labels, permanent or temporary signage, brochures and printed gallery guides, and visitor comments or response stations.		British	Childhood	London/Dock	Tate Modern	V&A
Labels	Diagrams and drawings Diagrams and drawings of the objects accompany the labels to help visitors distinguish small details	x		x		
	"Interactive looking" icons on labels Labels with 6 different icons that ask questions and promote interactive looking		x			

PRINTED						
Printed educational components rely on text for visitor usage or understanding and include labels, permanent or temporary signage, brochures and printed gallery guides, and visitor comments or response stations.		British	Childhood	London/Dock	Tate Modern	V&A
	Children's labels Colored labels in lower cases that ask questions or give a child-friendly facts			x		
	Pictures of object in context on labels Pictures of object in "real life" on labels provides context for viewers			x		
Guides	Printed thematic tours and gallery guides Includes printed guides, icons on maps, and signage on cases indicating the route/stops of tours, sometimes with extended information about the objects selected	x		x	x	
	Gallery hunts Round, two-sided guides challenging visitors to find a specific object and giving clues to its use			x		
	Laminated extended labels Extended labels and additional information in booklet format, laminated and available in galleries			x		
Visitor Responses	Comments or quotes on labels Labels with quotes, stories, or comments relating to specific objects from experts, community members or visitors		x	x		
	Visitor comments and responses (printed) Visitors can leave comments, drawings, questions, and responses on postcards which are then vetted by staff and displayed on a wall or in a binder				x	x

PRINTED						
Printed educational components rely on text for visitor usage or understanding and include labels, permanent or temporary signage, brochures and printed gallery guides, and visitor comments or response stations.		British	Childhood	London/Dock	Tate Modern	V&A
Signage	Museum map on wall signage Map on wall signage indicates location or area of museum	x				
	Reference/context maps Gallery signage includes geographical maps that provide context for time/location/place of objects in the gallery	x				
	Photo and artist's interpretation Photograph of geographical site and artistic interpretation of site provide context for object	x				
	Vocabulary, terminology, and definition of terms Vocabulary, terminology, and definition of terms on signage in various locations in gallery, including rationale for use of controversial terms		x	x		
	Programming and activities wall signage Wall signage lists exhibition specific programs, family programs, activities, and events			x	x	
	Timeline and sponsorship information Timeline of the history of London with options to purchase a date and add your own significant event to the timeline			x		
	Wall facts Interesting facts about artwork and artists placed on signage in unexpected places throughout museum; directs visitors to specific locations to find works of art				x	

AUDIO/VISUAL AND DIGITAL						
This category includes all computer-based components as well as audio/visual components, some of which may be accompanied by print materials. This section does not include computers that are available only in separate education, research, or study centers.		British	Childhood	London/Dock	Tate Modern	V&A
A/V Stationary	Listening stations and interviews Poetry, quotes, interviews with experts, and related information available at listening stations; no hand-held audio device is required			x		x
	Film clips of objects (film labels) Soundless film clips with or without captions located adjacent to objects and illustrate process, context, or different views			x		x
	Touch-sensitive projections Touch-sensitive projected questions with multiple answers on platforms between cases/recessed objects			x		
	In-gallery film theaters Small theater space in the gallery where visitors can watch a film related to the current exhibition				x	x
Interactive Computers	Computers with searchable collection database and museum information Searchable collection database and museum information available on computers in gallery			x	x	x
	Interactive film game Interactive film quiz game with touchscreen monitors, based on works from collection and available for multiple players				x	

AUDIO/VISUAL AND DIGITAL						
This category includes all computer-based components as well as audio/visual components, some of which may be accompanied by print materials. This section does not include computers that are available only in separate education, research, or study centers.		British	Childhood	London/Dock	Tate Modern	V&A
	Touchscreen monitors with computer games Thematic games and interactive programs on touchscreen monitors allow visitors to learn more about specific objects			x		x
	Community member tours on computer Computer in gallery offers a list of favorite works of art, a virtual tour, and comments by community members					x
Visitor Responses	Filmed questions and responses Visitors respond to an exhibition by filming a question for the artist or other viewers at designated locations in the museum; other stations allow visitors to watch the film clips or respond to a question				x	
	Design your own textile In-gallery computer allows visitors to design a textile in response to the examples on display and email the design					x
A/V Mobile	Audio or multimedia guide Audio or multimedia guide on hand-held device (ipod or smartphone)	x			x	x

APPENDIX B

Chart of New Educational Components at the Boise Art Museum

PHYSICAL		Based on these components	From these museums
Activities (Check-out)	Family Activity Packs Thematic packs available for check out by families, including games, scavenger hunts, inquiry prompts, hands-on activities, a children's book, and other educational resources	Backpack programs	British Museum and V&A
	Art Cards Four thematic decks of art flashcards with images, object information, guiding questions, and games	Children's merchandise	Tate Modern

PRINTED		Based on these components	From these museums
Label	"In My Words" labels Creative responses of children to specific works of art featured on object labels; workshop provided children with opportunity to learn about writing and formatting labels	Visitor comment labels Teen response exhibition	Museum of Childhood London/ Docklands
Guide	Discovery Guides Two thematic printed guides providing focused gallery tours for visitors (self-guided)	Thematic print guides and gallery tours	British Museum and London/ Docklands

AUDIO/VISUAL AND DIGITAL		Based on these components	From these museums
Interactive Computers	Sensory Station A custom-built pedestal housing a LCD touchscreen display connected to a secure computer providing film and audio clips related to the exhibitions	Listening stations and interviews Film clips of objects	London/ Docklands and V&A London/ Docklands and V&A
	Virtual Curator Custom-built pedestal with LCD touchscreen monitor connected to secure computer at which visitors may digitally arrange objects in a display or zoom in to examine details of objects	Laminated object images on wall Computers with searchable collection database (zoom feature)	BAM V&A
	Research Desk Research module with detailed information about select objects on view in the exhibitions	Computers with searchable collection database	Tate Modern and V&A
	Games Art games including matching game, jigsaw puzzles, and find the differences, with scalable difficulty levels	Touchscreen monitors with computer games	London/ Docklands and V&A
	Visitor Voices Two computers with LCD monitors at which visitors may create a digital postcard and email it, answer questions about the exhibition, post comments, and take a survey	Design your own textile Visitor comment stations	V&A Tate Modern and V&A

AUDIO/VISUAL AND DIGITAL		Based on these components	From these museums
A/V Mobile	Cell Phone Audio Guide Free audio guide accessible via cell phone featuring commentary by artists, experts, and museum staff	Listening stations and interviews Object labels with comments by experts or visitors	V&A London/ Docklands and Museum of Childhood

APPENDIX C

Exit Survey and Timed Observation Maps

Exit Survey: *Origins*

FOR STAFF USE ONLY Date: _____ Case Number: _____
Collectors' initials: _____ Volunteer ☐ Entered ☐

BAM | BOISE ART MUSEUM

Origins: Objects of Material Culture
Exit Questionnaire

1. Is this your first visit to the Boise Art Museum? Yes No
2. Are you a member of the Boise Art Museum? Yes No
3. What would you say is the main purpose of the exhibition, *Origins: Objects of Material Culture*?
   To show… [and/or] To make people…
   _____
   _____
4. What is one new idea you are taking away with you?
   I didn't know, or never realized that… [and/or] It reminded me that…
   _____
   _____
5. Did you use the interactive components in the exhibition?
   5a. Virtual Curator (rearrange the virtual exhibit case) Yes No I didn't see it
   5b. Sensory Station (music and videos about the art) Yes No I didn't see it
   5c. Cell Phone Audio Guide (audio guide on your cell phone) Yes No I didn't see it
   5d. What feedback do you have for us about these?
   _____
6. What was a highlight of the *Origins* exhibition visit for you?
   _____

Thank you for telling us a little bit about yourself.

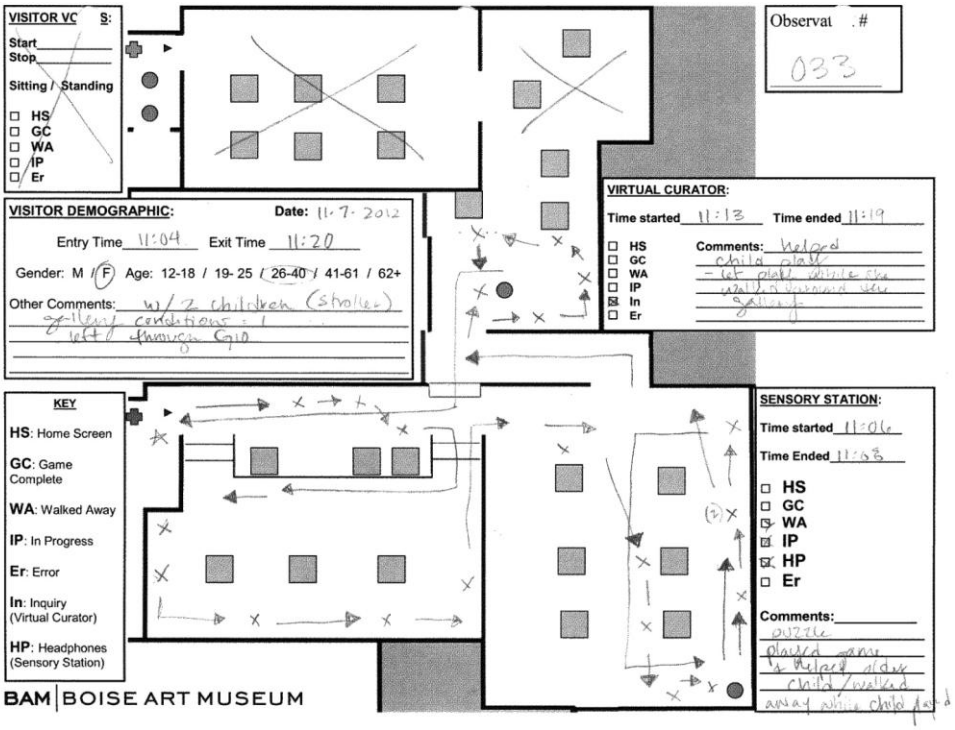
7. Gender: Male Female
8. Age: 12-18 19-25 26-40 41-61 62+
9. Zip Code: _____
10. How many are in your group today? 1 2 3 4 5+
11. Who is in your group today? Adults Teens Children

Thank you!

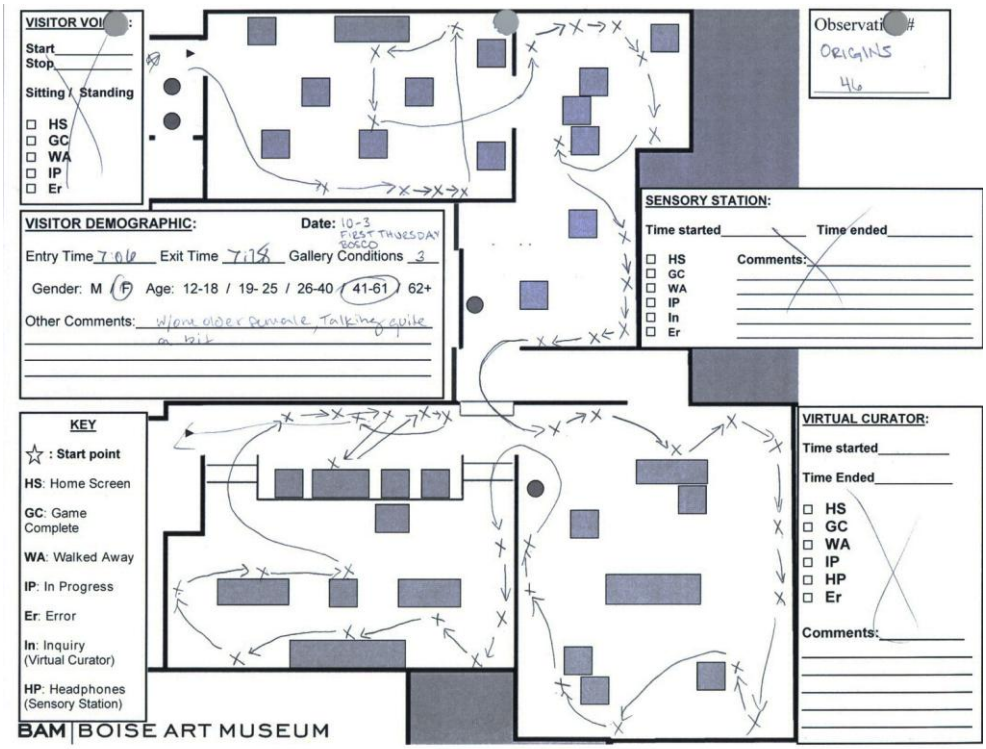
Thank you for taking a few minutes to complete this survey. Your input helps us create the best exhibit experiences possible. Please feel free to use the reverse if you need more space. Thank you for answering each question.

FOR STAFF USE ONLY Entry Time: _____ Exit Time: _____
Gallery Conditions: _____ Card Number: _____

Timed Observation Map: Eastern Traditions – Western Expressions



Timed Observation Map: *Origins*



APPENDIX D

Overview of Significant Findings

Eastern Traditions – Western Expressions

Significant Findings

- Between 25% (exit survey) and 30% (timed observations) of visitors used one or more of the new components
- The most heavily used new components among these users were the cell phone audio guide and the Virtual Curator
- The least used component was the Visitor Voices station
- Family Activity Packs were checked out 122 times, for an average of 4 per weekend
- Users of the Family Activity Packs spent an average of 50 minutes in the exhibition
- 90% of survey respondents felt the new components enhanced their museum visits and provided new learning opportunities

Challenges

- Signage directing visitors to use the new components was insufficient
- Location of the Sensory Station (back corner of a gallery) impacted its usage – 26% of survey respondents did not see the Sensory Station during their visit
- The large amount of content on the Sensory Station was problematic – some visitors did not use the Sensory Station because it was always in use by other visitors
- Location of the Visitor Voices station (alcove adjacent to gallery) impacted its usage – visitors either did not see the station or encountered it before entering the exhibition, so that they could not provide feedback about their experience in the exhibition
- Some visitors were confused about the In My Words labels, thinking that the children's recordings on the cell phone audio guide were adults or that the creative responses were factual

- Coordinating artists and experts to record cell phone audio guide segments was time consuming and led to inconsistencies in the quality of the recordings
- Securing permissions to use images of artworks for the art flashcards was prohibitive and meant that the flashcards were not available to visitors of the exhibition

Origins: Objects of Material Culture

Significant Findings

- Between 37% (exit survey) and 32% (timed observations) of visitors used one or more of the new components, representing an increase from *Eastern Traditions – Western Expressions*
- The most heavily used new components among these users were the cell phone audio guide and the Sensory Station/Research Desk
- The least used component was the Visitor Voices station
- Family Activity Packs were checked out 56 times, a decrease of more than 50% from the previous exhibition despite the fact that they were available daily rather than only on weekends
- Users of the Family Activity Packs spent an average of 53 minutes in the exhibition
- 89% of survey respondents felt the new components enhanced their museum visits and provided new learning opportunities

Challenges

- Location of the Visitor Voices station (alcove adjacent to gallery) continued to be problematic – as with *Eastern Traditions – Western Expressions,* visitors either did not see the station or encountered it before entering the exhibition, so that they could not provide feedback about their experience in the exhibition
- The location of the Virtual Curator (facing a wall with one large artwork rather than shelving with many artworks) led to lower usage of this component among visitors than the previous exhibition
- Functionality of the Virtual Curator was inconsistent due to the large file sizes of the images – the program often quit working and was "down" for up to several days at a time prior to being fixed by a contract programmer
- Securing permissions to use images of artworks for the art flashcards continued to be problematic
- Visitor services staff and volunteers did not consistently promote the Family Activity Packs to visitors due in part to inadequate training – staff and volunteers

placed too much reliance on a small sign about the Family Activity Packs at the admissions desk to inform visitors about this new educational component

Overall Observations

- The new components provide new ways for visitors to interact with and learn about the artwork, and are overall effective at engaging visitors
- The costs of maintaining and implementing the new components must be carefully weighed, and expenses should be included in the museum's fundraising strategies
- The time commitment by staff to create and maintain the new components is overwhelming, and may require selective use of components for future exhibitions or the addition of new staff (education, computer programming, photography)
- More collaboration between curatorial and education staff in the development of the exhibitions (from initial concept to the exhibition opening) is necessary to ensure prime placement of the new components in the galleries and reduce last-minute changes to the educational content
- Traditional didactic materials, including handouts and extended labels, must be provided along with new components to ensure that the needs of all visitors are met
- Visitor services staff and volunteers should have more training in promoting the new components, particularly the Family Activity Packs and cell phone audio guide
- Changes to the museum's accession process—securing permission to use images of the artwork for educational purposes when an object is accessioned—will significantly reduce the time required to produce printed educational products (such as the art flashcards)