Interactive Technology in Art Museum Exhibitions

A Case Study on Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour

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Abstract

Existing scholarship in museum learning theory emphasizes the importance of meaning-making as it relates to learning in the museum setting. Other literature advocates interactivity as a catalyst for making meaning. This research investigates emergent interactive technologies as viable and effective tools for making meaning in the art museum, focusing on the ubiquitous computing components of the Jordan Schnitzer Museum of Art's exhibit: *Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour*.

Keywords: Museum Learning, Interactive Technology, Meaning Making in the Art Museum

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> Museum missions should state unequivocally that an educational purpose is imbedded in every museum activity.
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> -American Association of Museums
> *Excellence and Equity* Report, 1992

Introduction and Problem Statement

The topic of how visitors learn in exhibition settings has expanded in recent decades in museum studies literature. This includes inquiry regarding new museum exhibition theories and methods and interest in identifying elements of effective exhibits. Current scholarship supports interactive exhibits as an effective way to engage and make meaning for visitors and enhance learning in the science museum setting (Muller, Edmonds, & Connell, 2006; Rahm, 2003; Speaker, 2001). Research in the last decade has also focused on learning in the art museum setting (MacRae, 2007; Danko-McGhee, 2006; Saava & Trimis, 2005), but far less consideration has been given to the inclusion of interactive technology in the art museum setting. The existing scholarship that addresses interactive technology in art museums is generally limited to temporary science/art hybrid exhibits (Sassen & Zhu, 2008) or information systems within the art museum (Venkatachalam, 2004).

In the characteristically static art museum environment where learning is typically visually based, this paper will identify and investigate alternative types of learning opportunities that can be carried out with minimal disruption in the art museum setting. This assessment will include a brief overview of how museum visitors learn, including a

discussion on popular museum learning theory and learning styles as they relate to effective museum exhibit techniques and the museum visitor experience. While case studies on emergent exhibit techniques using interactive technology can be found in the current scholarship, studies examining their suitability in the art museum setting are conspicuously absent. My research addresses this gap in the scholarship through an inquiry on the suitability and limitations of the ubiquitous computing components in the Jordan Schnitzer Museum of Art's (JSMA) exhibit: Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour.

Definitions

Cartography- the art of map making

Constructivism- a learning theory in which the learner uses his or her previous beliefs and knowledge to construct new meanings

Ichnographic- describes the depiction of a geographical area as a ground plan, with topographical features being represented through outlines

Ubiquitous Computing- (in the museum setting) when computer elements are embedded in the exhibit

Vedute- (*It.*), "view," the term used to describe the etchings of the vedutisti

Vedutisti- (*It.*), "view makers," the term used to describe Guiseppe Vasi and other artists who created etchings of Rome and other cities

Verstehen- (*Ger*.), "to understand," a term that means, "empathetic understanding that interpretive social science takes as a primary goal for social research' (Neuman, 2006, p. 87).

Viewsheds- on the Nolli map, pinpoints the position of the *vedutisti* and his field of vision

Research Questions

How and what visitors learn in the museum setting has been the focus of alternative education research for the last several decades. Research suggests that "over 80% of . . . learning is not done in a traditional educational setting" (Boram, 1992, p. 121). This revelation speaks to the importance of the study of learning spaces that exist outside the classroom, such as museums, and how learning takes place in these environments, as well as implications for exhibit design as it facilitates learning in the museum setting. Sharon MacDonald (2007) explains, "The field of museum visitor research is not well coordinated, largely because it spans so many disciplines"(p. 149). This diversity has led to several widely accepted theories in the museum education field. It is beyond the scope of this paper to address each of these theories; rather it focuses on a few important approaches that speak to the interactive technology in the exhibit *Guiseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour*, and through a detailed analysis of this exhibit.

In this investigation, the overarching question I seek to answer is:

•Is the technology used in the Vasi exhibit appropriate for the art museum setting?

Sub-questions I answer through this inquiry include:

•Does the interface disrupt the art museum environment?

•What are the advantages and disadvantages of ubiquitous computing as used in the Vasi exhibit?

•Which museum learning theories are supported by the technology used in the Vasi exhibit?

In addition, this research addresses broader questions that may be relevant to the museum profession. These findings may help support conclusions regarding my main and sub-questions. These include:

•What exhibit techniques enhance museum learning?

•How can exhibit designers appeal to the widest audience possible?

•What other types of technology is being used in the art museum setting?

This capstone addresses these questions through research drawn from an extensive literature review, as well as additional coursework. One course that contributed to this research was an art history course that focused on the Giuseppe Vasi exhibit at the Jordan Schnitzer Museum of Art taught by Dr. James Harper. This course explored 18th century Rome, during the time when Giuseppe Vasi and his contemporaries created *vedute* of the city. The varying perspectives of the *vedutisti*, as well as the different representational approaches employed by these artists, create a comprehensive picture of what Rome looked like in the 18th century. This course was supplemented by the exhibit: *Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour,* on view at the Jordan

Schnitzer Museum of Art through January 2, 2011. The ubiquitous computing elements employed in the Vasi exhibit became the focus of my case study.

Another course that supported this research was a Special Projects Exhibits course taught by Dr. Phaedra Livingstone. Exhibition development was the focus of this course and students actively researched, designed, and created a small exhibition for the Knight Library based on the University of Oregon's Special Collections archives. Aspects of exhibition development, including effective display techniques and content development were among the topics that this course addressed. I completed both of these classes in the Fall 2010 quarter.

Researcher's Role and Methodology

I am approaching this research from the interpretive social science paradigm. I am working off the assumptions that art museums wish to cultivate future audiences and our society sees the value of education. Furthermore, I embrace the social value argument regarding the arts and their fundamental importance in education. In this inquiry, I ultimately seek *Verstehen* and am very interested in determining what holds meaning or relevance for visitors in the art museum context (Neuman, 2006). The acknowledgement of museum visitors' "human agency" (Neuman, 2006, p. 90) makes sense in the museum setting where learning is visitor-driven and less directed than traditional educational settings. Consistent with the interpretive social science paradigm, the evidence I collect will be primarily qualitative (Neuman, 2006).

My personal interest in the exploration of interactive exhibits, specifically in the art museum, developed as a result of a series of frustrating experiences at an art museum with

my young daughter. This particular art museum was, at this time, decidedly, and perhaps intentionally, not family-friendly. I am a painter and sculptor and studied art history in college. I also see artistic tendencies in my child, so I of course wish to foster her love of art. However, after several visits to this art museum that ended in tears for my daughter, it occurred to me that by contrast, our time spent at more interactive museums was not only more enjoyable, but also more educational. It disturbed me to think that by exposing her to an austere, authoritarian art museum environment, I could actually have been discouraging her appreciation of art. This resulted in our general avoidance of art museums for several years, and even now at age 8, as I write this, she is less than enthusiastic about visiting the art museum.

As I watch my child learn and grow, it seems obvious that when she is playing with something, *interacting* with something, she is learning. This observation led me to wonder how art museums could engage children and foster future audiences without alienating their adult audiences. I also asked how exhibit techniques employed in the art museum could be improved to appeal to a wider audience and enhance the art museum experience. The computing components that I explore in this research are of course just one way to create engagement, but throughout the literature I reviewed, there is a general attitude of reticence to include computer technology in the art museum setting. I would argue that the young generation is unlike any we have seen before. So much of what they do, and how they interact, is translated through technological interface. "As of March 31, 2009, the Pew Internet and American Life Project found that 87 percent of youth ages 12-17 use the Internet; of these, 75 percent use instant messaging and 48 percent of those IM every day"

(Stogner, 2009, p. 385). This immersion in communication through technology would suggest that youth prefer it and may possibly demand it as part of elective activities.

The future success of the art museum as an institution may depend on the alteration of exhibit techniques to appeal to the younger generation and secure a future audience as a result. A recent study conducted by the American Association of Museums found that children aged 5 to 9 are the "critical age for converting children into lifelong museum-goers and advocates" (Center for the Future of Museums, 2008, p. 15). And while this research addresses an exhibit that is targeted toward an adult audience, part of my argument for the inclusion of interactive technology in the art museum setting acknowledges a general paradigm shift towards a future audience that demands technological interaction. One objective of this inquiry is to see how this can be done without eclipsing the educational mission of the art museum and without alienating current adult audiences.

While this inquiry may have implications for the art museum field as a whole, the focus is limited to the discussion of the ubiquitous computing components used in the Jordan Schnitzer Museum of Art's exhibit: *Giuseppe Vasi: Lasting Impressions from the Age of the Grand Tour* and as such, can only be used to draw conclusions about the technology used in this exhibit. The complex subject matter of the Vasi exhibit was created for an adult audience and the evidence collected and observations made only reflects the responses of that audience.

Museum Learning Theory

John Falk and Lynn Dierking, (1995) in *Public Institutions for Personal Learning* establish seven major influential factors in the learning process as they apply to museum

audiences. The first of these includes the influence of prior knowledge and experience on perception. As Jeremy Roschelle (1995) points out, "There is widespread agreement that prior knowledge influences learning and that learners *construct* concepts from prior knowledge" (p. 37). Perception and memory, Falk and Dierking (1995) argue, are inextricably linked to learning. The ability of the museum visitor to perceive and identify an object is directly influenced by his or her past experience. Previous knowledge and experience support and shape new experiences and additionally create personal meaning for museum visitors. Douglas Worts (1992) advanced the idea that an optimal exhibit experience is dependent on the "personal meaning generated by the visitor" (p. 157).

Personal meaning making is crucial to the construction of a visitor's own understanding (Hein, 1998). This process is central to constructivist pedagogy, which postulates that "learning requires active participation of the learner in both the way that the mind is employed and in the product of that activity, the knowledge that is acquired" (Ibid, p. 34). Prevailing alternative education theory champions constructivism as one of the most effective approaches in museum learning. George Hein (1998) explains, "Constructivism provides the most comprehensive and elegant theory to consider how visitors can both use their previous beliefs and knowledge to construct new meanings and how they can actively carry out this process" (p. 154).

Applying constructivist principles to create effective exhibits require several considerations. According to Melinda Mayer (2005), "Two essential features are requisite to constructivist learning. First, the participant must be actively engaged in the learning process. Second, what is learned must be confirmed not through external criteria of the

discipline, such as art history, but through the visitor's own sense-making mechanism" (p. 14).

Learning Styles

To fulfill these directives, consideration must be given to the modes through which the museum visitor gathers information, or what museum educators call learning styles. The theory of multiple intelligences (MI), as presented by Harvard psychologist Howard Gardner, is a theory of learning styles that challenges the notion that a single number, an intelligence quotient (I.Q.), defines an individual's intelligence. Gardner argues for "the existence of . . . discrete 'intelligences' in human beings, combinable in different ways to form an intellectual repertoire of different intelligences" (Hopper & Hurry, 2000, p. 26). These include linguistic, logical-mathematical, musical, bodily kinesthetic, spatial, interpersonal, intrapersonal, naturalist, spiritual, and existential intelligences. Gardner's educational approach advocates the presentation of central concepts in various ways that accommodate different intelligences: "Each student will be exposed to a range of approaches/activities representing central dimensions of the concept or topic, because each method of representation imparts important and different insights for understanding. MI is an important tool in designing these alternative methods of understanding" (Cohen, 2001, p. 49).

While Gardner's theory was not developed specifically for museum or educational purposes, it has been adopted by museum learning theorists to guide information presentation in the museum setting. Veteran exhibit planner Kathleen McLean (2005) explains, "A limited approach will appeal to only a limited segment of the audience. If

exhibit planners are to provide something for the widest possible range of museum visitors, exhibitions must accommodate all types of learners" (p. 9). This clearly supports the argument for the necessity of multiple modes of information retrieval in exhibition practices.

Contextual Model of Learning

The consideration of multiple intelligences has been categorized by Falk and Dierking (1992) as an important aspect of a visitor's personal context in the Contextual Model of Learning (CML). Compatible with constructivism, CML is a model of learning that "frames visitor learning as occurring through the overlapping and interacting contexts of the personal, sociocultural and physical" (Mayer, 2005, p. 15). As a museum visitor interacts with exhibit components, each component he or she pays attention to becomes part of "the visitor's immediate context- his [or her] constructed experience. . . [It] is filtered through the personal context, mediated by the social context, and embedded within the physical context" (Falk & Dierking, 1992, p. 4). CML is a lens through which museum educators can assess internal and external factors that affect a museum visitor's experience. Included in this model are questions of motivation, perception, processing and memory, as well as retrieval and transfer.

Motivation as part of the personal context is a significant factor in the assessment of exhibit efficacy. Simply put, ". . . individuals pay more attention to the things in which they have more interest. Interests are predictably based upon prior experiences, knowledge, and feelings- a classic feedback loop" (Falk and Dierking, 1995, p. 11). Mihaly Csikszentmihalyi and Kim Hermanson (1995) classify motivation as either extrinsically or

intrinsically rewarding. Extrinsic motivation is rewarded through external means "to obtain praise or to avoid punishment" (p. 67). Museum education research is more concerned with pinpointing the factors associated with intrinsic motivation.

Csikzentmihalyi and Hermanson (1995) point to curiosity and interest as natural intrinsic motivators. Curiosity is defined as "the likelihood of investing psychic energy in novel stimuli" (p. 68). Interest "refers to a differential likelihood of investing psychic energy in one set of stimuli rather than another" (Ibid, p. 69). Using these natural propensities, exhibit designers use what is known as "the hook" to incite curiosity and/or interest and encourage the museum visitor's interaction with exhibit components. Interaction is imperative for learning. "By any definition," explains George Hein (1998), "there can be no learning (or meaning making) if there's been no interaction. In order for learning to occur in the museum, the visitor has to attend to something" (p. 136).

Interactivity and/or engagement become more effective when presented with "subsequent, reinforcing experiences" that enhance the learner's assimilation of exhibit content (Falk & Dierking, 1995, p. 11). These considerations influence prevailing practices in museum content presentation, such as information layering and the creation of narrative. In order to create meaningful experiences for visitors, some practitioners have implemented what one study calls a "funnel approach" to exhibit design (Schauble & Bartlett, 1997, p. 784). The idea is to pull the museum visitor in with the overarching ideas of the exhibit and embed deeper and more detailed information within layers of the exhibit for those who seek a deeper understanding.

The application of various methods of interactive technology is one way exhibit planners and educators create museum experiences based on museum learning theories. When applied in meaningful ways, technological interface acts as a catalyst for the visitor's learning experience, helping the visitor to construct personal meaning and navigate through layers of information.

The Art Museum and Learning Technologies

Kurt Neugebauer, the Associate Director of Administration and Exhibitions at the JSMA, predicted in a lecture on November 30, 2010 that the use of multimedia technology will become standard in art museum exhibitions. According to Neugebauer, technology, when applied correctly, "accentuates the art without taking away from it." But some art museums have been slow to embrace non-traditional interactive exhibit practices, especially technology-based exhibit components, for a number of reasons. Encouraging interactivity in an environment full of precious objects and artworks that visitors are prohibited from touching is historically unconventional. Environment disruption is another consideration, and cost is nearly always a factor. One critic of interactive technologies has argued that while digital devices are very expensive to implement and maintain, they do very little to bring in additional revenue to art museums (Schwarzer, 2001). Other detractors call attention to the irony of the visitor "looking down at computer screens while standing in front of a painting" (Ibid, n.p.). This would point to questions of authenticity and experience, and the risk of leading visitors to rely too heavily on the technological interface. As Marjorie Schwarzer (2001) observes:

> Indeed, many art connoisseurs maintain aesthetic notions of art viewing as transcendent and self evident, in little need of explanation. Are [the devices] so distracting that they ruin the chance for elevated experiences with art? Or, by providing more information, do they actually increase visitor appreciation?" (n.p.).

Some museums, however, see the value in cultivating interest in younger generations and have implemented technologies that tend to attract them. "There is no substitute for interaction with original works of art," says the director of the National Gallery, Earl A. Powell III. "We have found that careful uses of digital technology have not diminished the viewing or learning experiences for our visitors . . . As a matter of fact, the technology appears to attract more of the younger generation to the gallery to see the art" (Cited in Pollack, 1999, n.p.).

Interactive Technologies

Museum technology falls into several categories. Most current applications of technology in art museums involve the visitor's ability to retrieve additional information from web-based information systems or databases. Audio tours, where the visitor rents a handheld audio device, have been in use for many years in the art museum setting. More recently, various museums have developed programs that use some form of Personal Digital Assistants (PDAs). A less expensive option involves iPod downloads offered on many museum websites. Cell phone tours are also gaining popularity. And there is ubiquitous computing, in which the technology is embedded in the exhibit. A case may be made for each of these applications as they enhance the museum experience and create learning opportunities.

In 1997, the European Union launched a study on what might be considered the ultimate PDA. Named Hyper Interaction within Physical Space (HIPS), this subject of a three-year long study made a case for the problem of a system offering too much information. The HIPS system uses a global positioning system (GPS) to track art museum visitors' positioning within the art museum, analyzes the visitor's preferences, and offers information based on that data. According to one researcher, "when the viewer stands in front of an artwork [the visitor] is assailed by an information overflow" (Venkatachalam, 2004, p. 183). This distracts the visitor and prevents him or her from engaging with the artwork, according to HIPS critics (Ibid). While the potential of HIPS technology is still being considered, this cost prohibitive and somewhat intrusive technology provides a good example of technology eclipsing the museum learning directive.

iPod tours and cell phone tours are a comparatively inexpensive way visitors may now enhance their art museum experience. Many museums offer tours on their websites for download prior to an art museum visit. But it could be argued that the museum experience becomes an isolated one when the visitors are listening to prerecorded audio and not interacting. Studies have shown that dialogue during a museum visit is an invaluable vehicle for construction of meaning (e.g., Weier, 2004).

And finally, scholarship on ubiquitous computing suggests that it is highly effective for creating meaning and engagement for visitors in the museum setting. While there are more and more examples of ubiquitous computing being used in the art museum setting, it has most often and most successfully been used in science and history museums (Hall &

Bannon, 2006). Questions of environment disruption and cost are considerations when assessing the suitability of ubiquitous computing in the art museum setting.

Ubiquitous Computing: A Case Study

The argument for implementation of interactive technology as an exhibit component in the art museum is only valid if the technology is appropriate for the presentation of the exhibit content. This case study examines the exhibit presented at the Jordan Schnitzer Museum of Art entitled, *Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour.* Called "the most ambitious exhibition in the museum's nearly eighty-year history,"(Hartz, 2010, p. 7) this is the first time that the JSMA has attempted to use ubiquitous computing as an exhibit component. In addition to traditional exhibit methods, *Vasi's Rome* utilizes graphic imaging technology to offer the visitor innovative ways to access and compare information. This inquiry seeks to justify the use of computing in this exhibit by describing the deeper content made available to the museum visitor through the use of the computer kiosks, identify advantages and limitations of this technology, and through the consideration of visitor feedback.

This exhibit documents Rome as it appeared in the 18th century through prints, texts and other images created by Giuseppe Vasi and other *vedutisti*. Vasi and his contemporaries used several different methods to record Rome and Vasi's Rome combines these various approaches to create a comprehensive image of the Eternal City, as the Grand Tourists would have perceived it in the 18th century.

According to John Pinto (1976), the development of geometric perspective greatly influenced visual representation in Renaissance art and architecture. The use of geometric

perspective results in the illusion of space and depth on a two dimensional surface. The *vedute* of Rome in the 18th century, traditionally rendered in geometric perspective, such as Vasi's series of views in his *Delle Magnificenze di Roma* (1747-1761) offer the armchair tourist an immediate visual understanding of a location's appearance and scale. These images, accurate in their depiction of architectural detail and specific and identifiable topography, also used visual devices that sometimes bent the rules of geometric perspective to create a more effective image. As co-curator and architect James Tice (2010a) explains, Vasi employed both "visual conventions and inventions, allow[ing] him to evoke many places in Rome more effectively than scientifically constructed perspective or modern photography would" (p. 67). These "inventions" that Vasi used to communicate the essence of place, especially for someone who is not familiar with the sights of Rome, are detectable through a comparison with other images.

A variation on geometric perspective is used in the rendering of Vasi's panoramic view as well (fig. 1). Illusion of depth on a two dimensional surface relies on a single observer stationed at a fixed point in space. Pinto acknowledges the limitations of correct perspective in the representation of complex objects such as vast geographical locations, where in reality the observer would be physically unable to see an entire area all at once. Artists in the time of Vasi used visual devices to compensate for impossible views. "The depiction of cities in oblique projection," explains Pinto (1976), "as well as the familiar bird's eye view, permitted an illusion of total vision. In Renaissance plans of this type," such as Vasi's *Prospetto di Città Roma visto dal Monte Gianicolo* from 1765, "cities are shown as if seen from a single elevated viewpoint, from which the projected line of sight meets the earth's surface at an oblique angle" (p. 35).

This method, however, results in the distortion of spatial relationships. To communicate space between objects more accurately, artists developed the ichnographic approach in representation (fig. 2). This approach, typically used by modern day cartographers, depicts a geographical area as a ground plan, with topographical features being represented through outlines. The ichnographic approach places the viewer above the area with "an infinite number of viewpoints, all perpendicular to each topographical feature" (Ibid, p. 35). Pinto asserts that the ichnographic plan "constituted a new conceptual attitude toward the representation of cities, in which quantitative topographical relationships were given visual priority over both symbolic values and the actual appearance of the city" (Ibid, p. 35). Spatial relationships were conveyed with far more accuracy through ichnographic representation, but such plans were less capable of communicating the feel or impression of a city (Ibid). Giovanni Battista Nolli's *La Pianta Grande* from 1748 is an example of "an ichnographic plan," as explained by Jim Tice (2010b), that "presents the city with an exactitude that allows one to immediately compare size, position and shape" (n.p.).

Mario Bevilacqua (2010) observes that while cartography and cityscape are decidedly different approaches to visually representing a location, they are often used in conjunction with one another. Furthermore, the inclusion of individual views of landmarks adds an additional layer of depth for viewers' comprehension of a location. In the case of Vasi's numerous etchings of views of Rome, it is very likely that he used Nolli's ichnographic plan as a guide (Ceen, 2010). All but 17 of Vasi's 238 views from the ten books of the *Magnificenze* can also be located on Nolli's map. "Vasi's method for depicting his views," Jim Tice (2010a) explains, "can be better understood by systematically

reconstructing his station points and view sheds on the Nolli map and then comparing the resultant views with photographs taken from the same vantage points" (p. 69) (figs. 3 & 4).

Technology and Exhibit Components

Given the complexity of *Vasi's Rome's* subject matter, the exhibit's curators designed a comparative approach made possible through several interactive kiosks placed strategically throughout the exhibit (fig. 5). The kiosks consist of Apple iPads encased in protective housing. The kiosks in the exhibit use Geographic Information System technology, and this platform was developed for the *Imago Urbis* website and subsequently this project by the InfoGraphics Lab in the Geography Department at the University of Oregon. The kiosks allow visitors to view Vasi's viewsheds positioned on Nolli's map as well as current photos. Other kiosks allow visitors to compare various views of Rome as interpreted by other vedutisti, such as Piranesi, Canaletto, Wittel and Panini, and compare them to Vasi's prints from the *Magnificenze* and current photographs (figs. 6, 7, & 8). Visitors also have access to many of the actual physical prints and paintings.

The kiosks are silent and intuitive. Simple instructions are visible below the iPads, and the program is easy to navigate as the information is layered in a logical manner. As with all technology, there is the possibility of malfunction. In his lecture on November 30, 2010, Kurt Neugebauer mentioned that Wi-Fi stability, which is essential for the kiosk function, has also been a problem at times. But these issues are relatively minor concerns when one understands the advantages of this technology and the greater content made available through its use. The technology is meant to enhance the actual artifacts, not replace them, and allow visitors to access deeper layers of information to create a

comprehensive understanding of the subject matter. As Jill Hartz (2010), the executive director at the JSMA explains, this exhibit is a "multifaceted project that, through its varied platforms, deepens our understanding of Vasi, the art and architecture of his period, Roman patronage, urban design, and the Grand Tour, and helps articulate the lessons of Rome for our lives and cities today" (p. 8).

Visitor Experience

A two-hour focus group was held on August 6, 2010, prior to the exhibit opening. The goal of this group was to gather feedback and generate ideas regarding exhibit content, evaluate the touch screens and labels used in the exhibit, as well as discuss the exhibit's marketing strategies. According to the focus group report, "Participants [ranged in age] from teenagers to seniors, and included high school students, UO students, UO faculty/staff, community members, museum volunteers, K-12 teachers, and members of the Latino and Asian American communities" (Kaplan, 2010, p. 1).

On the subject of exhibit content, members of the group revealed that the ability to relate the exhibit content to one's own life was of particular concern. Questions of alienation from the lives of the aristocratic Grand Tourists were raised by focus group members. "The Grand Tour," explained Kaplan (2010), "was the luxury of a privileged class, more than travel is today. This could be both fascinating to some and alienating to ethnic groups whose role was more as a servant during these times" (p. 1). As a participating observer, I would argue that the content becomes more accessible and comprehensible through the technological interface. The content presented through the kiosks constantly referred to the visitor's own time period via contemporary photographs,

allowing the visitor to compare and contrast 18th century Rome with the city of the present day to create a personal connection. Visitors were encouraged to imagine themselves as 18th century Grand Tourists, touring the exhibit much like the Grand Tourists toured Rome. I speculate that because all present-day museum visitors were removed from the time period presented in this exhibition by nearly three centuries, it required a leap of the imagination for all visitors, regardless of ethnicity or social status, to identify with the Grand Tourists. Therefore, the narrative of the exhibit, expressed through labels and enhanced by interactive technology, played a crucial role in supporting the generation of personal meaning for visitors.

Other concerns of the formative focus group included the possibility of the academic subject matter only appealing to a limited segment of the museum audience. Engaging children, members of the focus group predicted, could be problematic considering the exhibit's complex nature. Indeed, this exhibit was not created with children in mind. The ability afforded by the kiosks to jump between images, however, created an engaging visual activity that could be enjoyed by visitors of all ages, even those who lacked the ability to read. On several occasions I observed school-aged children playing with the kiosks and engaging in conversation with their adult counterparts regarding their own observations.

The focus group's overall response to the iPads was favorable. The iPads encouraged the visitor to participate in a constructivist learning experience through active engagement. "Participants liked that the technology provided additional depth to their looking," according to the focus group's report (Kaplan, 2010, p. 1). Participants also commented on the ability to focus on and enlarge areas of interest as an asset of the

technology. The careful layering of information helped guide the visitor learning experience as the visitor navigated the different levels of content. The cross referencing of the various artists' work with each other, modern photographs, and preparatory drawings was made possible through the interactive kiosks whereas without them, the complex subject matter would have been difficult to present.

Comments were also randomly collected from a handful of informal interviews conducted after the exhibit opened. Again, the general response to the iPad components was positive, and many of the visitors indicated that the technology was accessible and that the technology "brought the etchings to life" (Taylor, 2010, p. 1). According to the data that has been collected, visitors across various age groups, from different education levels and backgrounds found ways to connect with the Vasi exhibit experience. This may be in part due to the multiple modes of information presentation that appeal to a variety of learning styles.

And finally, research indicates that while "visitors want the museum experience to be memorable, they also want it to be enjoyable" (Mayer, 2005, p. 16). All information collected to date on the visitor experience within the Vasi exhibit suggests that it is entertaining as well as educational. Successful exhibits by definition must keep the audiences' attention, and clearly the Vasi exhibit accomplished this, partially due to its interactive and entertaining elements. In addition, a successful exhibit must appeal to a wide audience. Jill Hartz (2010), executive director of the Jordan Schnitzer Museum of Art, describes the goals of this exhibition as, "nurturing new scholarship and giving it a lively visual and public presence for diverse audiences in the academy, the community, and

beyond" (p. 10). This is an important achievement, especially considering the academic and complex nature of the subject matter.

Conclusion

This paper approaches the subject of technology in the art museum setting from the perspective that if technology is to be used, it must be appropriate for the exhibit. The goal here is to integrate engaging technology and enhance exhibits without disrupting the art museum environment and alienating the art museum's present audience. When applied in careful ways, the advantages of the integration of computing include the ability to convey complex information like that found in the Vasi exhibit in a more concise and comprehensible manner. Also beneficial is the potential to attract a wider, more diverse audience through the use of various modes of exhibit content presentation. The onus of selecting exhibit content that can be successfully and appropriately mediated through interactive technology lies with art museums' education and exhibits departments. "Many art museums have a long history of creating innovative ways of mediating visitor experience in the galleries," explain Karen Knutson and Kevin Crowley (2009), but there is much to consider in the process of interpretation: "[Art museums] must make hard choices about the information that is to be provided. Each art work might be used to explain issues of culture history, patronage, geography, techniques, artist intention, or theories of beauty, among other things" (p. 3). Clearly, then, the discussion of whether ubiquitous computing is appropriate for a particular exhibit must be evaluated on a case-by-case basis.

There can be little argument that the use of computer technology is the medium through which the children and young adults of this era communicate and entertain

themselves. It is my contention that concessions must be made by art museum professionals to embrace emergent technologies if they want their museums to remain relevant to future generations. Engagement, resulting in museum learning, is the natural result of appropriate uses of interactive technology.

Bruce Wyman, the director of technology at the Denver Art Museum puts the successful integration of the art museum and technology into perspective:

> Real and virtual worlds should blend to the point where they're just different lenses into the museum experience. . . The old definitions don't apply anymore. Moving back and forth between these modes is second nature for people today. "Talking" to someone can mean in person, on the phone, by email, or through social networking. It's all just talking. The primary focus is on the experience; technology is secondary. (Cited in Fischer & Levinson, 2010, n.p.)

The Vasi exhibit exemplifies the successful integration of the display of beautiful, important works of art with engagement-creating technology in which the technology is unobtrusive but effective.

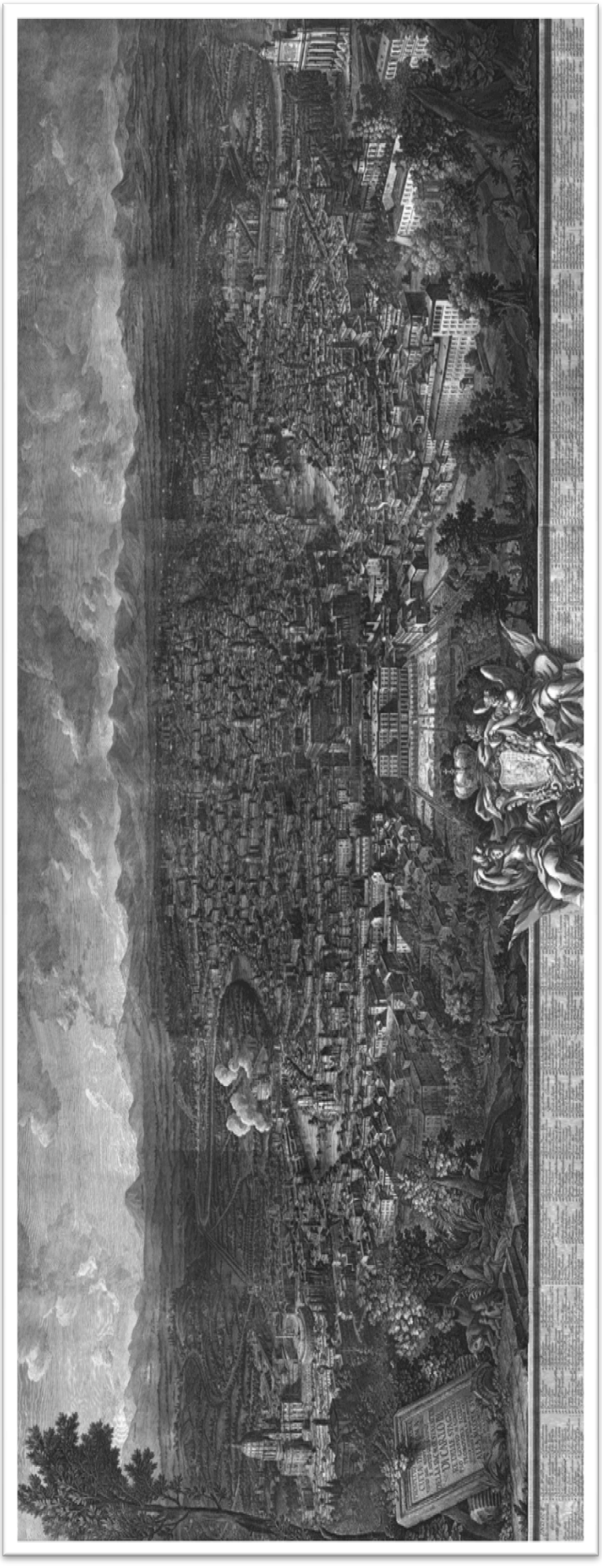

Figure 1. Giuseppe Vasi, 1765. *Prospetto dell'alma città di Roma visto dal Monte Gianicolo.* Panorama of Rome. Vincent J. Buonanno.

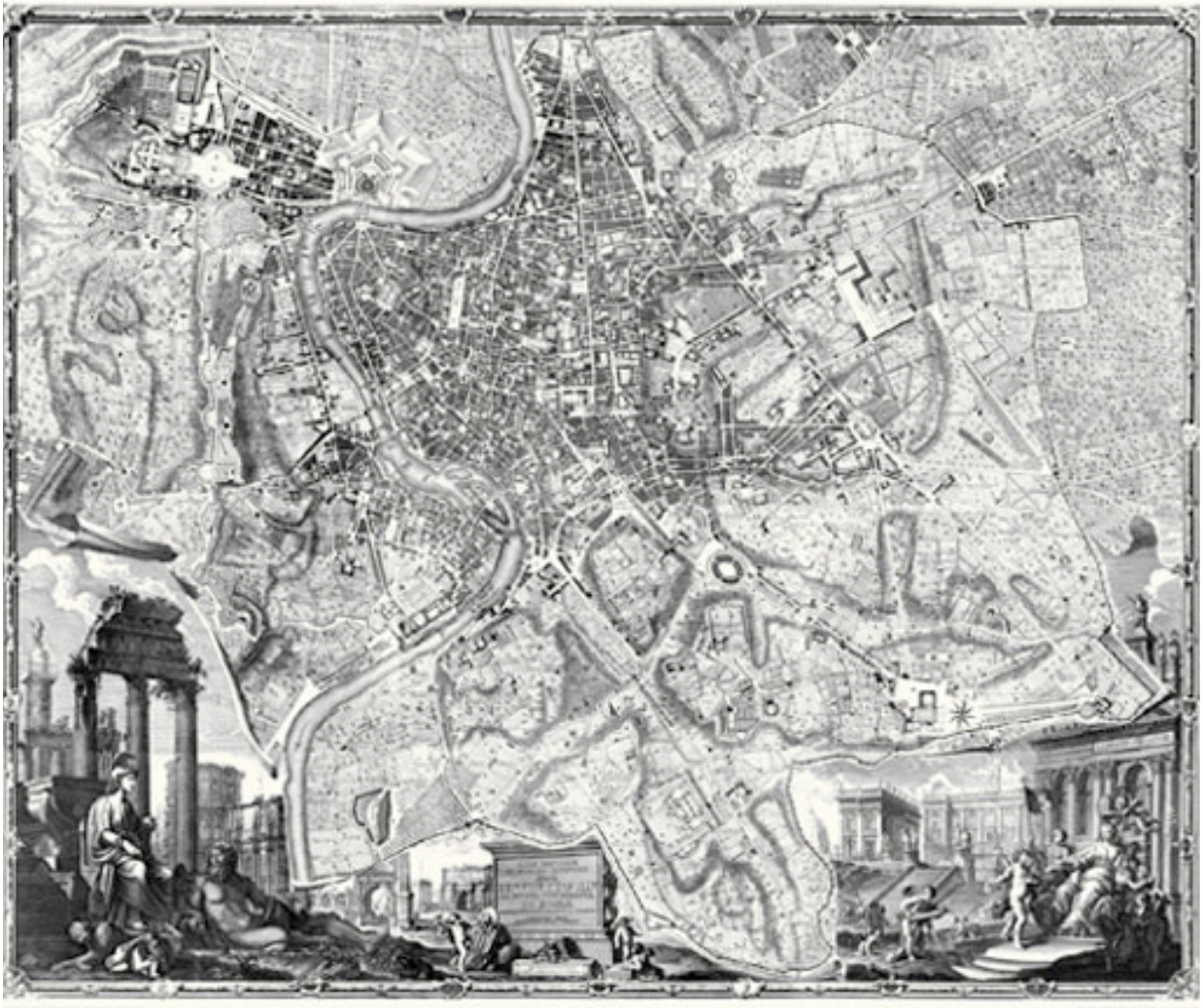

Figure 2. Giovanni Battista Nolli, 1748. *La Piante Grande di Roma.* Map of Rome. Vincent J. Buonanno.

Figure 3. Giuseppe, Vasi, 1752. *Piazza della Rotonda,* from the series *Delle Magnificenze di Roma antica e moderna* (Book II, Plate 25). Vasi's view of the Pantheon. Vincent J. Buonanno.

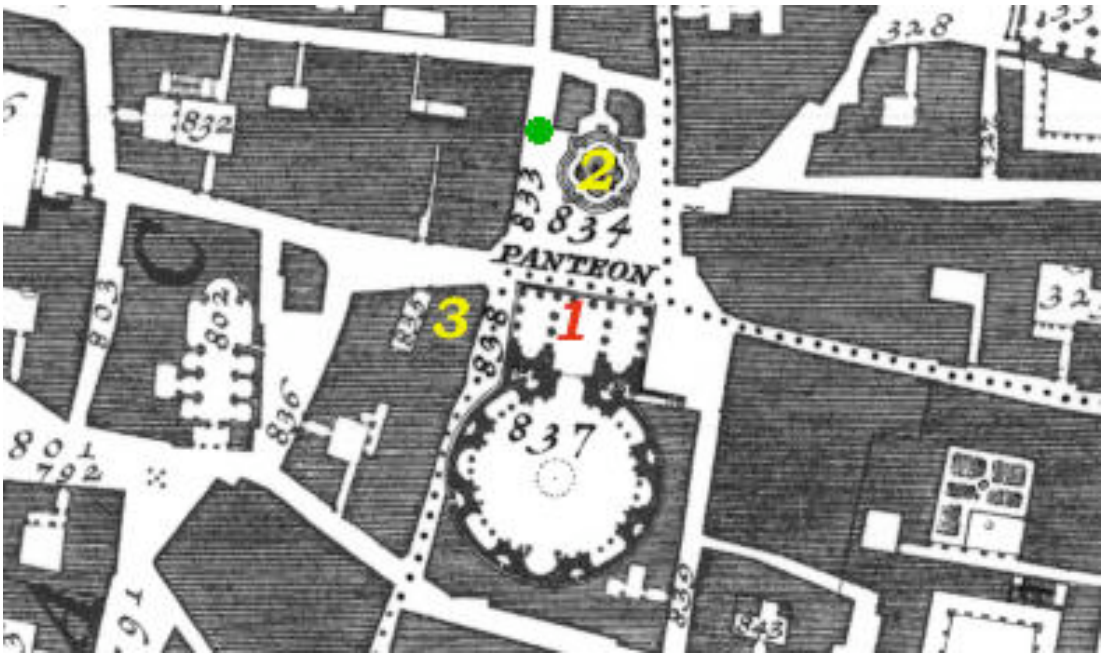

Figure 4. Detail of Nolli's Map of Rome showing the Pantheon, 1748. Vincent J. Buonanno.

Figure 5. Kiosks in the exhibition *Vasi's Rome: Lasting Impressions from the Age of the Grand Tour.* Jonathan B. Smith.

Figure 6. Guiseppe Vasi, 1754. *Ponte Adriano,* from the series *Delle Magnificenze di Roma antica e moderna* (Book V, Plate 86). Roberto Piperno.

Figure 7. Photograph of Ponte Adriano, 2009. Roberto Piperno.

Figure 8. Gaspar van Wittel, 1682. *Ponte Adriano.* Roberto Piperno.

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