

Museum Informatics: Educating the Public
and
Use of Digital Technology

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26 February 2008

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The advent of digital technology provides for a much broader public access to museums' collections and interpretive knowledge. It, more importantly, enables museums to better meet their mission as institutions of public education. In this context, museums search for their new social and theoretical identities while vigorously adapt to the fast pace of technological change. As a result of this on-going struggle the idea of *museum informatics* is born.

Providing a broad range of access to museum collections, educating the public about their collections and the surrounding interpretations are only a few of the many museums' institutional responsibilities. The most recent Code of Ethics for Museums published by the American Association of Museums (AAM) begins with the following:

Museums make their unique contribution to the public by collecting, preserving, and interpreting the things of this world. Historically, they have owned and used natural objects, living and nonliving, and all manner of human artifacts to advance knowledge and nourish the human spirit. Today, the range of their special interests reflects the scope of human vision. Their missions include collecting and preserving, as well as, exhibiting and education with materials not only owned but also borrowed and fabricated for these ends. (Par. 2)

The Code also, in its sections on *collections* and *programs*, very clearly assigns to the museums, among others, the responsibility of making their collections and programs accessible to the "widest possible audience" while educating the public with respect to "scholarship" that is

marked by “intellectual integrity.” AAM’s Code of Ethics has become integral to the mission statements of nearly all American museum members. As a result, these museums have set their goals parallel to the Code and been working to achieve them through the means available.

Currently, one of the most pressing needs among our educational institutions, including museums, is the need to rapidly integrate digital technology into the fabric of our traditional educational settings. This goal is followed with the need to provide both the faculty and students with the skills they require to operate in such integrated educational environments.

Many of the required skills may be learned through exposure to the digital culture. Today, the presence of digital technology is sensed by nearly everyone who lives in America. People often purchase goods and communicate their telephone and e-mail messages On-line. Similarly, they use the Internet to search and collect information, enroll and attend classes, while performing their work duties from the comfort of their homes. And, we know all this, because the American mass media floods our eyes and minds with images that evidence of the growingly easy-to-achieve digital culture with its highly popular appeal.

Nevertheless, the possession and use of personal computers have become a common place crossing the boundaries of class and economical divides. According to the National Telecommunications and Information Administration’s 2000 report, forty percent of American households owned at least a computer; from this number, only eight percent of the households earned below \$10,000 a year (NTIA, par. 1). In 2007, the percentage of American households that owned at least a computer had grown to about eighty six percent of which twenty two percent lived below the established national poverty lines.

One of the contributing growth factors to wider accessibility to the digital technology is the result of an on-going effort by the mainly non-profit organizations to refurbish and recycle donated computers (May, par. 15). Justgive.org is one of the well-established Internet sites responsible for matching a variety of charitable organizations with computer donors. After completing the donation process, the organizations then give away the up-graded and refurbished computers to the less fortunate households in their communities along with the related programs and basic skill training (Justgive.org, pars. 13 - 20).

The hands-on and interactive qualities of the use of digital technology matched with its widely accepted and accessible presence are attractive to educators who find experience as the primary mean to education. “I assume that amid all uncertainties there is one permanent frame of reference: Namely, the organic connection between education and personal experience” (Dewey 25). John Dewey’s philosophy on education as being the result of the synthesis between a transmitting referential source and the experiential interaction of a learner with the source currently is paramount to achieving a *progressive education* through the use of digital technologies.

“Progressive education,” as Dewey explains, is the result of democratically arranged conditions that ultimately insure a greater accessibility to a shared experience for the largest segment of a population who is in the market for the most uplifting qualities of human experience (Dewey 34). When placed in a room while supervised by an educator who facilitates the tools of interaction and provides for guidance as to the quality of the outcome, learners begin to develop a series of habits. The learners’ habits as to differentiating between what is accepted amongst their community as being better in quality to those of lesser significance insures the

continuity and yet betterment of human experience (Dewey 35). “The principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after” (Dewey 35).

Dewey emphasizes the necessity of giving freedom of choice to learners who are engaged in the mechanics of a shared experience but carefully observing and evaluating all the possible outcomes. As a result, the educator needs to find and make educational experiences visible while making “mis-educative” experiences invisible. “The belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative” (Dewey 25). Dewey then explains that, “Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience” (25).

Within Dewey’s educational frameworks, digital technology is a must-have tool for museums and other educational institutions. Its readily informative and hands-on applications transcend the notion of a “classroom.” As a result a shared experience may be virtually achieved in a domain where a multitude of people around the world interact with each other and with the virtual site itself while being fed a stream of relevant information by museum educators. In this virtual domain, learners have the necessary freedom that Dewey prescribes to experiment with the mechanics of virtual navigation and communication in great numbers.

In defining “communication as culture” and in the context of “Constructivist” philosophy of education, like Dewey, Eilean Hooper-Greenhill finds communication as integral to a culture when meaning is constantly constructed through a shared preferential system of thought. This culture could lose its healthy flow of social life and individual identity in the absence of the means to communicate. She goes as far as elevating the status of communication to a “secular

ritual” whose process is no less possible without “sharing, participation, fellowship, and association” (Hooper-Greenhill 565).

One of the factors separating an experiential or constructivist model from that of the behaviourist’s is in the way information flows and processes from one end to the other. In both experiential and constructivist models, as we have briefly discussed earlier, information is first introduced by a source (i.e. teachers, books, videos, internet sites, etc.) and then experimented with by a class of learners (students, site visitors, etc.), before it is deemed useful, significant, neutral, or completely, as Dewey puts it, “mis-educative.” The constructivist’s model gives more freedom to its community of learners to question and examine information and negotiate its boundaries while developing an interpretation of their own. In contrast, the behaviorist’s model of education is authoritarian and definitive providing for a one-way transmission of information from a source onto its community of learners.

Henry Giroux, as cited by Hooper-Greenhill and as presented in a recent On-line interview, examines the behaviourist model in the context of the global culture and in contrast to that of Western ethnocentrism. “From Giroux’s perspective, culture is a site of multiple and heterogeneous borders, where different histories, languages, experiences and voices intermingle amidst diverse relations of power and privilege” (565). In other words, Giroux acknowledges the fact that not all learners share the same Western cultural values and habits when reading into a transmitted piece of information. In Giroux’s and Dewey’s frameworks, learners are empowered to receive information ubiquitously, process it critically, appropriate and interpret it politically before reintroducing it back into the complex web of human experience.

“Constructivists propose that knowledge is constructed through active interpretations of experience,” professes Hooper-Greenhill. Then she continues, “Knowledge is not a single, self-contained body of facts that can be transmitted, unchanged, from one individual to another; knowledge is plural, and fluid, brought into being by the processes of knowing” (567). If the constructivist model is the ideal model for educating museum learners, then what are the challenges facing our museums today? After all, the constructivist model sounds like a slam-dunk solution to the need of broadening the learner-focused “culture of communication” in our museums. The quantitative aspect of this model demands a greater presence and democracy of users (or, learners), while its qualitative standards require an environment in which first-hand experiences of learners are shared, studied, modified and recycled. Furthermore, it emphasizes the importance of free expressions of conflicting opinions, cultures, and histories as corrective tools in the process of constructing meaning and sequencing of cultural values.

One may recognize a generalized image of a museum as being a depository of naturally strange, scientifically exceptional, and culturally exotic objects. It is a place where *objects of curiosity* are carefully stored, constantly preserved, and methodically displayed to insure the continuity of the privileged academic views. Traditionally, in America and Europe, school groups visit a site like this. Often led by their teachers, students walk through a pre-planned path. They stop and gaze at a single work while their teachers provide them with the source information pertaining to the piece. A few may ask a handful of questions in regards to the historical context of the piece, and then the group moves onto the next carefully chosen objects. At the same time, in the museums’ lecture hall, an art historian or an archeologist is lecturing to a crowd of eager graduate students who are watchfully engaged in taking meticulous notes about

her groundbreaking discoveries in the ruins of an ancient city. Here, information appears to be successfully transmitted and received. How the receivers or learners behave in response to this information and what they do with it determine the success of this behaviourist model of education.

I as an educator myself find the behaviourist approach acceptable and yet insufficient. There is nothing completely wrong or unfamiliar with this generalized image of education in a museum. This same image in fact matches the traditional behaviourist model of education that entrusts the authority and authenticity of its source material to a teacher. The teacher transmits the entrusted knowledge to her learners (or, visitors), while the learners often unquestioningly submit themselves to the authority of the material fact. They memorize these facts, so when asked again in an examination, students may recite the exact same information. Any variation of or deviation from the pre-established facts could result in students' academic failure.

Socially, too, students are expected to speak to the same shared authority of pre-established knowledge. When faced with a question of cultural or scientific significance, the merit of one's response is measured against that same authoritative and pre-established knowledge often generated in educational institutions such as universities and museums.

Incidentally, is this behaviourist model truly sufficient for the development of a complex learner-based education? Inspired by the constructivist model, my answer is negative. "Within constructivist theory any discussion of education focuses on the processes of learning rather than the processes of teaching. The role of the teacher is to provide stimulating environments for learning that take account of the existing knowledge of the learner, and that enable both the use of prior knowledge and the development of new knowledge" (Hooper-Greenhill 567). Here, "to

provide stimulating environments for learning” is the key phrase that could profoundly impact the educational mission of our contemporary museums. By adopting the constructivist mindset, museum leaders acknowledge the dire need to further engage their local as well as other civic communities in their museums’ programs. Mastering civic engagement, as Ellen Hirzy puts it, is a task “critical to museums’ evolution, relevance, and survival” (10). “Museums are now, “becoming places of dialogue, advocates of inclusion, places of values, and incubators of community,” (Archibald 5).

One of the tools that are today increasingly used by the museums to get their communities interested and involved is digital technology. During the last fifteen years, digital technology mainly because of its popular appeal, ease of use, ease of access, availability, and high-speed capabilities to store and process gigantic amount of information has become the darling tool of choice and symbol of progress in museums.

Digital technology has ubiquitously crawled its way into all aspects of our society forcing even the most technologically inapt members to learn its basic skills. For many, the minimum familiarity with digital technology has become a matter of social and professional do-or-die. Communities from all walks of life, in order to stay in the current of their society, need to know how to use a word-processing program, exchange e-mails, and surf the Internet. Many choose not to leave the comfort zone of their homes or offices and purchase whatever product they need on the Internet. Everywhere one looks, in homes, schools, libraries, museums, stores, hospitals, and more, she finds computers and people who are using them to conduct their daily life activities. Furthermore, people can now easily use their digital cellular phones to exchange voice, video and e-mail messages, search for information or visit a virtual museum Online.

As we discussed earlier in this paper, such digital revolution could be aptly responsible for the formation of what Hooper-Greenhill calls a “culture of communication.” As a culture, digital communication also seems to merrily fit in Giroux’s definition of culture as being “a site of multiple and heterogeneous borders, where different histories, languages, experiences and voices intermingle amidst diverse relations of power and privilege” (565). And, for Dewey’s idea of learning through experience, hands-on and otherwise, digital technology seems like a godsend with no parallel in sight. Perhaps since the invention of television and the mass media, no other medium of communication has been so successful in galvanizing the public around its presence.

According to the University of South Australia professor, Darren Peacock, currently the rate of information production is greater in volume than any other area of human production. “More than half of the population is employed in information related activities and more than ninety percent of the information that we create is in digital form” (Peacock 59). Nevertheless, this rate of popularity and production can only intensify, as digital technology becomes an increasingly integral part of our daily life.

A revolutionary and highly popular technology demands its own language and innovative ways of implementation and examination. “Museum informatics” is an expertise invented by both digital technology and museum professionals to address the administration of the digital culture of communication in museums. “Museum informatics is the study of the sociotechnical interactions that take place at the intersection of people, information, and technology in museums” (Marty 3). It encompasses all the traditional and contemporary aspects of museums including the collection, documentation, restoration, and exhibition of objects as well as the

knowledge that surrounds them. Museum informatics professionals are furthermore involved with the marketing, public relations, and nearly all aspects of museum education.

Paul Marty who is a Florida State University professor and an expert in library science, computer science engineering, and ancient history explains the foundation of museum informatics in the following passage:

Museum informatics is an extremely interdisciplinary field of study. To meet the challenges of the museum's changing role in the information society, researchers studying museum informatics have drawn upon theories and techniques from dozens of related fields, including digital libraries, human-computer interaction, social network analysis, cognitive science, museum studies, library and information science, etc. While much early work in this area was primarily focused on questions of how information technologies should be used in museums, a number of researchers and professionals are now emphasizing the need for an underlying body of theory and methods for studying museum informatics as well as related areas such as museums and new media or digital cultural heritage. (Marty 5)

The public of today with its "information-savvy audiences" demands a lot more of museums and the displays of scientific-natural-cultural objects in their galleries. People seem to have a hunger for information, especially the kind that is up-to-date and fast. They especially appreciate digitally transmitted information that they can access at a place and time of their choosing. The public increasingly prefers to receive and communicate this information through a variety of user-friendly computers, cellular phones, I-Pods, and museum information consoles.

I, as a college teacher, can testify to the preferential and heightened use of digital technology in my classrooms. When my students were given the option to choose between writing a reaction paper on a handful of paintings by physically visiting a local art museum or writing about them by virtually looking at the reproductions shown on the museum's website, they all chose the latter. They increasingly recite Internet sources in their research papers; and, unless forced otherwise, a good majority of them prefer going Online instead of actually visiting a library or museum to complete their primary academic research.

Now, many of my students bring their laptop computers to class and use the available wireless capabilities to access On-line images and information to compliment our class discussions. In real time, and while in class, they e-mail me asking questions and commenting on the related topics of interest. Consequently, in most cases, I manage to respond before they leave the class or shortly after they departed. At the heart of this enthusiastic application of computers is a common reason: They make people's lives easier to manage. It is true especially as in the case of the digital technology. It readily increases the volume and speed of finding, collecting, processing, managing, and communicating information. This list of learning and technological advantages used to be a wish list for many scholars, museum educators and alike; but, today the list is a celebrated reality.

Nevertheless, to better serve the public, museums and other educational institutions need to constantly update their equipments and staff their departments with personnel who are not only familiar with the information Technology (IT) but also those who are trained in museum studies and education programs. "Information and communication technologies in museums are changing so rapidly that most museums remain desperate for employees who can guide them

through the basic technology hazards of planning digitization projects, purchasing collections information systems, or joining online data sharing consortia” (Marty 271). Marty and other museum informatics experts believe that finding such energetic, highly versatile and educated personnel may not be readily possible. They recommend, at least until museum informatics is a well-developed and established academic concept, the real focus should be placed on the technical training of the current museum professionals (273).

Granting that museums will have all the current technologies they need and the experts who operate them, then how exactly will museums live up to their goals as public educational institutions? To answer this question, one should first examine the general application of digital technology by the museums’ education departments. Such technical application may generally be used in the following categories: To digitize images of museums’ objects and collections; to catalog the respective images and their related scholarly literature; to streamline the digitized data into the Internet and store it onto Digital Video Disks (DVDs) and other semi-permanent storage devices; to make the digitized data accessible to the public; to inform the public about a variety of scholarly work done on the objects and images in question; and, finally, to maintain a series of widely inclusive and open forums presenting different views on the objects and images in the museums’ collections. ¹

Museum registrars are credited for being the first group of museum professionals who sensed the need for *digitization* of their collections. In 1970s, “Registrars were [are also] among the first museum professionals to work with system developers to create the first generation of the collections management systems that we use today in museums” (Jones 12). Furthermore, registrars are credited for the early formation of “standard terminology for describing museum

objects” as well as working on issues related to copyright and fair use. “Industry advances in the late 1980s and in the 1990s made it possible for museums to begin to incorporate digital images into collections management systems. This was based on scanning technologies that reduced the amount of heat and light generated per scan making it safer for light sensitive works of art on paper, for example, to be reformatted” (Jones 16).

The *Getty Information Institute*, the *Museum Computer Network*, and *Archives and Museum Informatics Publishing* are the three founding organizations, which according to Jones, contributed to “furthering the understanding of the potentials of digital imaging in museums” (16). They encouraged the new digital mindset and helped the creation of a new market for digital imaging technology and programs that could utilize these images into detailed database systems.

Today, it is a common knowledge that computers and their database programs can hold, organize, and process terabytes and even more of the information mass. Organizing information is imperative to the success of museum’s educational goals. A person should be able to easily navigate and search a museum’s databank, and subsequently retrieve the relevant information to satisfy her curiosity, validate her research, and/or enhance her academic presentations. This simple proposition is one of the premises of the integration of digital technology and learning.

Prior to the implementation of digital technology in museums, the public had to often go to the museum under study and manually search its index-card cabinets to find and acquire information. This process, depending on the volume of information in question, could take hours and was as a result limiting. Today, the antiquated index-card system is nearly extinct, because museums’ database programs are well organized, widely available, and easily accessible to the

public. All that one has to do is to go Online, or pop into her computer one of the museum's DVDs, or use the museum's own computer consoles to find her desired information.

To whom do our museums owe this technological marvel? By the available accounts, one could say, the true father of museum database systems is the New York University's computer scientist, Dr. Jack Heller, who founded an innovative and interdisciplinary academic program called, "The General Retrieval and Information Processor for Humanities Oriented Studies (GRIPHOS)" (Misunas, Par. 4). In 1970s, Heller transferred his program to the State University of New York at Stony Brooks and subsequently began his work on an extensive digital cataloging project for the Metropolitan Museum of Art and the Museum of Modern Art (Misunas, Par. 9). In 1972, Heller and David Vance formed the Museum Computer Network (MCN), what is today the primary academic source of museum informational and developmental studies (Misunas, Par. 10). 2

In 1990s, after the technology of digital imaging and museum database systems improved commercially and when their use in museums became feasible, the demand for multimedia educational products also grew rapidly. At that time, Georgia Tech's Interactive Media Technology Center (IMTC) took the lead by designing in-depth informational and interactive video presentations on a variety of museum objects. These interactive presentations could be accessed initially through the computer consoles (or, kiosks) at the Michael C. Carlos Museum at Emory University. Visitors to the museum could choose from a variety of computer images the one that corresponded to the object they were interested in (Jones 17). Then by clicking on the selected image a QuickTime VR (QTVR) video presentation would launch showing the object from all around while streamlining, in an adjacent frame, the relevant information in its written

and voice-over forms. Incidentally, this technology today may seem ordinary, but at the time of its genesis, it took the museum world with rolling excitement.

Jones describes an example that was a part of the original Michael C. Carlos museum's interactive program in the following:

One segment of the presentation shows the bat flute in the hands of Mexican ethnomusicologist Antonio Zepeda who played the flute under controlled circumstances. The museum recorded a video sequence that shows the conservator taking the flute from storage, preparing it to be played, and then cleaning it and returning it to storage. This allowed the museum to explain the work of the conservator as well as allowing the viewer to hear the flute as it was played. This project was one of the first to use QTVR. (17)

Today, similar interactive, in-house presentations and newer educational tools, such as download-able video podcasts, may be accessed through the museum's Website and its Odyssey project (<http://www.carlos.emory.edu/>) all around the world. And, this is not really the extent of what museum informatics has achieved. There is ocean of Online information now that could benefit not only the American public but also the global community.

Excited with the prospect of finding the most informative, fun, and yet easy to navigate museum Website, I examined a variety of On-line museums. I then narrowed down my choices based on the two criteria of comprehensiveness and user-friendliness. What I came up with was *Boston Museum of Fine Arts* (MFA) and its creatively designed Website (<http://www.mfa.org/>).

The MFA's homepage is dynamic; the page rhythmically changes seamlessly. New patterns, colors, and images flash gently back-and-forth inviting me to choose from a number of

primary headings: VISIT, LEARN, EXHIBITIONS, COLLECTIONS, ABOUT THE MFA.

By passing my virtual pointer over each of the primary headings, I activate a list of subheadings.

I click on LEARN. By doing so, I get to choose from the following subheadings: Explore, Community, Educators, Families, Adults, College, Interactive Tours, Mobile Wallpapers, E-Cards, Podcasts. It took me about two hours to tirelessly explore only the primary heading, LEARN. There are so many fun and learning opportunities on the MFA site for everyone. If this is a glimpse to the current state of virtual museums, I cannot wait to see what museum informatics could offer us in the future.

As a part of its Mission Statement, MFA's Board of Trustees writes, "The Museum creates educational opportunities for visitors and accommodates a wide range of experiences and learning styles. The Museum educates artists of the future through its school. The creative efforts of the students and faculty provide the Museum and its public with insights into emerging art and art forms" (MFA, Par. 5). The MFA's statement here, at least partially, is in concert with Dewey's idea of a "progressive education," one that results when uplifting qualities of human experience are readily shared by the greatest number of people (Dewey 34). And, as far as the constructivist educational philosophy is concerned having interactive access to the museum's information is a productive thing.

There is, however, one very important aspect of the constructivist education that is still in its infancy at the MFA and elsewhere. Museum informatics needs to take a step further to provide for widely inclusive and openly transparent live scholarly forums. Exchanges of ideas need to take place in the museum space or on its On-line arena. In theory, should Dewey, Hooper-Greehill, and Giroux wish to collectively establish an experiential and constructivist

culture of communication that is responsive to a variety of cultural values and interpretations, such live and open forums are essential to the success of museums as institutions of public education. Dialectical exchanges of ideas and the synthesis resulting from such forum provides for a broader perspective of cultural, natural, and scientific problems surrounding museum objects. Here museum educators, just as Dewey suggested, act as facilitators of experiential learning sessions, in which peers pull and push conventions and invent new solutions to their ongoing life challenges.

The opportunities at hand are numerous, and no one has articulated this fact better than Hooper-Greenhill in the following:

Museums are at a point of change. The possibility of cultural re-opening, of reinterpretation, of re-negotiation, is deeply exciting. Museums today have the opportunity to push at existing borders, to change current relationships, to manipulate and break down old orthodoxies, to enable a broader, more inclusive approach to a more inclusive society. Through developing their communicative functions in creative and innovative partnerships with their audiences, art museums can become vital new institutions for the 21st century. (573) 3

One could in details write extensively about the advent of digital technology in museums without actually addressing the most crucial question: How could museums bring their learners and educators together in a place where they can experiment with the information at hand and experience their turns of success and failure? Museum professionals, educators and experts in museum informatics need to wholeheartedly look for their new social and theoretical identities

not entirely in the streams of the information highway, but also in the context of education theories.

Digital technology, could bring the network of museum educators and their learners closer, and yet it may not, in itself, be a magical solution to an age-long dilemma, how to entice learners to voluntarily ask for knowledge.

Notes

1 Surprisingly, there is no complete reference to this list in any of the source material I read on the topic of informatics or museum information science. I compiled this list through a thorough examination of related works cited and works consulted.

2 Jones reports 1967 as the official date of MCN's formation, while Misunas and Urban mention 1972 as its official date. My comparative study of these and other sources support Misunas' account as being more accurate.

3 Here, Eilean Hooper-Greenhill specifically refers to "art museums" as future institutions of vital importance, should they further develop "their communicative functions in creative and innovative partnerships with their audiences." I would think this fact is plausible in regards to all museums.

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