Intersections of Technology with Art Education

Body + Machine
Interactive

computer
game creations
digital art
perceptions
&
attitudes

virtual reality
guests

virtual reality's differential perception

aesthetics of cloning

Web art education
A Dream of Digital Art: Beyond the Myth of Contemporary Computer Technology in Visual Arts

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Abstract

Today, many artists work on computers and peripheral devices. How can their works be categorized as art? What should their works be called? How do we define this art form? In this philosophical inquiry, I review the traditional classification of arts in their historical context, to argue that, instead of "computer art," "new media art," "Internet art," or other such terms, “digital art” is a better term to describe art created using the computer. I do not suggest the term "digital art" for art that is output from the computer to various surfaces and replicates traditional forms such as painting and graphic design, but instead argue for it as a term to define art that involves the computer in producing the work and that is ephemeral and non-atom based. In order to establish a clearer definition of this new art form, I compare digital art with other conventional art forms ontologically, and try to distinguish digital art from other art forms by using both traditional and contemporary aesthetic theories. When developing the framework of this essay, Steve Dietz's (2002) article “Ten Dreams of Technology” and Jon Ippolito’s (2002) “The Myths of Internet Art” provided important inspirations. Their insights on the impact of computer technology and the development of contemporary visual art offered fundamental starting points to my arguments.

Technology has impacted the world of art over centuries. In the realm of art education, the combination of printing techniques and photography not only changed the notion of art creation, but also enhanced the study of art. Photography benefited art education at the turn of the 20th century in magazine publishing during the arts-and-crafts movement, in the picture study movement of 1899, and in Arthur Wesley Dow’s synthetic art education begun in 1899; it continues to do so today in curricula based on the elements and principles of design (Efland, 1990). The development of computer technology in the late 20th century has had a huge influence at every level of education. Becoming an aggressive user of computer information technologies has become an important qualification for an art teacher.

In art classrooms, art teachers teach students how to create works of art through the use of various materials. They apply oil pigments or watercolors to a piece of paper or canvas to create a painting; they shape a lump of clay by hand or with tools; they carve a piece of wood to create a sculpture. People have no trouble accepting these materials and processes as art. What if a student took a photo using a digital camera, saved the image in a computer, and transformed the image into a watercolor picture using computer software such as Photoshop®? Should this student’s print-out be accepted as a work of photography, watercolor, printmaking, or “computer art”? Moreover, should we accept it as a work of art? If so, should the instruction of creating “computer art” be taught in the domain of art education or technology education? In fact, creating works through a computer has been applied in many art classes. Additionally, the new pedagogy of the so-called “cyber creations” has been successfully employed in some inclusion art classrooms (Keifer-Boyd & Kraft, 2003). Traditional concept of “works of art” is now challenged by contemporary computer technology and has consequently influenced the policy of art education. Carol Gigliotti (2001) points out that, by the end of the 20th century, art education policy
tried but was successful in matching the speed of the development of computer technology. She claims that computer technology used in art creation has changed our aesthetic experience, however; art educators and art education policymakers have not fully acknowledged this change in curricula and standards.

**Computer Art as an Unfit Term: A Taxonomic Perspective**

Conventionally, art forms are seldom categorized by naming them after the tools that they employ. Paul Oskar Kristeller (1965), in his essay “The Modern System of the Arts,” claims that though the terms “Art,” “Fine Arts,” or “Beaux Arts” are often identified with the visual arts alone, they are quite commonly understood in a broader sense. In this broader meaning, the term “Art,” according to Kristeller (1965), refers to the five “major arts” of painting, sculpture, architecture, music, and poetry. He argues that this system of five major arts is of comparatively recent origin and did not definitely take shape before the 18th century.

Plato’s notion provides one of the earliest recorded categorizations of art; it is based on human purpose and activity with a material substance. In the *Republic*, Plato argues that “for each thing there are these three crafts, one that uses it, one that makes it, and one that imitates it” (Plato, 1992, p. 272). For Plato, a musician is the one who knows how to use the thing created; a craftsman is the one who creates the thing under the instructions of the user; and a painter and a poet are the imitators of a craftsman’s creation. In Plato’s time, craft and art shared the same name, “technē.” Martin Heidegger points out that: “The Greeks ‘technē’ use the same word for craft and art and call the craftsman and the artist by the same name: technities” (Hofstadter, 2001, p. 199). Plato’s political ideal is that art should be censored since it could corrupt society (Plato, 1992). Fears of the power of art are still prevalent today and censorship does abound. However, the Internet provides a site to exhibit art that is not censored easily.

Immanuel Kant, an influential philosopher since the 18th century on Western views of art, separated arts and crafts into two different categories of products of human creative activities (Guyer, 2000). He defines art as liberal, aesthetic, and free play, in contrast to handicraft, the so-called mechanical, remunerative, and labor art. In Kant’s system, there are three kinds of aesthetic art: first, the art of speech, including rhetoric and poetry; second, the pictorial arts, including the plastic arts (sculpture and architecture) and the art of representing (painting); and third, the art of the beautiful: play of sensations, such as music. Kant’s idea is very close to Kristeller’s modern system. During the 1820s, G. W. F. Hegel very nearly followed Kant’s system in his lectures on fine art, except that he divided poetry into epic poetry, lyric poetry, and dramatic poetry, and he further divided dramatic poetry into tragedy, comedy, and drama (Knox, 1975). Hegel focused on the literary function of dramatic poetry, but not on theatrical performance.

In addition to the categories of art mentioned above, theater and dance are two traditional art forms which today are usually labeled performing arts. Musicologist Curt Sachs (1965) maintained that dance is a high art which has already reached a degree of perfection that no other art can match. Thus, he claimed, “The dance is the mother of the arts” (p. 3). Theater historian Oscar G. Brockett (2000) points out that theater is a complex art form which has developed over at least twenty-five hundred years. In addition to the traditional art forms mentioned above, Brockett suggests that cinema and photography should be included in the field of fine arts in the 20th century.

Though the classification of arts has changed over time to include work created with new technologies, it is notable that art processes have been often used to name the art form, rather than the materials or
tools used. Thus, painting is a traditional art form, and we do not call it “paint art,” “pigment art,” or “canvas art”; pictures produced by photography can be accepted as art in the 20th century, but we do not call photography “camera art.” Similarly, the term “computer art” seems to go against this taxonomic convention.

Instead of “computer art,” or the more commonly used descriptor, “new media art,” I suggest the term “digital art.” Nicholas P. Negroponte (1995) in his book Being Digital uses “digital world” to express the way that communication has shifted from atom-based to digital. He claims that “the future is driven almost 100 percent by the ability of [a] company’s product or service to be rendered in digital form” (p. 12). This notion can also be applied in the realm of art. Lev Manovich (2002) employs the term “digital art” to introduce 10 key influential texts which were written about the new art form created by computer technology. “Digital art” also seems appropriate by comparison with some other familiar terms:

1. “Technological art,” a term occurring in Steve Dietz’s (2002) essay, is too comprehensive to explicitly define works created by the computer, which was invented in the 20th century.

2. “Electronic art,” used in Manovich’s (2002) essay, is still too broad because electronic communication can be either analog or digital.

3. “Internet art” used by Jon Ippolito in a (2002) essay is acceptable. Just as theater art is referred according to its location—in ancient Greece the audience sat on the slope which served as the theatron, the origin of theater (Ranke, 2000, p. 63)—the term “Internet art” refers to the site where it is performed. However, the concept of “Internet art” is limited because works of art created via computer are not necessarily contained by or viewed on the Internet.

4. “New media art” suggests the use of the newest technologies in the creation and exhibition of the art. It also suggests that the aesthetic concepts and theories specific to digital art are forever new, rather than an artform that has a history with particular aesthetic theories, even if those theories are often contested and revised.

One might argue that a new art form need not follow traditional categorization. In practice, “computer art” refers to art made by computer or art displayed (or performed) via computer, or both. This can lead to some confusion. In her book Digital Art, Christiane Paul (2003) points out the dilemma of how to distinguish the new art forms using digital technologies “as a tool” or “as a medium” (p. 8). Many traditionally categorized works of art can be also created using the computer. Computers can generate photography, printmaking, painting, or even sculpture. In addition, powerful image and sound programming functions have enabled the computer to support multiple effects for cinema and the performing arts. Expanding video and audio performing functions has also enabled the computer to replace some conventional media such as television broadcasting and stereo players. However, though we display (or perform) these works via computer, they have not been defined as new art forms. Paul claims, “Not every work that makes use of digital technologies also reflects on those technologies’ aesthetics” (p. 27). She further points out that “technologies often tend to develop faster than rhetoric evaluating them, and we are still in the process of developing descriptions for art using digital technologies as a medium” (p. 67). What then, does “digital art” signify? As art teachers, how should we present this new art form to our students?

Many art educators have employed computer technology in their instruction. Bonnie Halsey-Dutton (2002) points out that technology integration has become a reality and a valuable tool in today’s educational instruction. She claims, “With the resources at hand through technology, lack of access to art history resources is no longer a limitation” (p. 20). However, she emphasizes using the computer as an instructional tool but not as an artistic medium. Thus, computer use in art educa-
tion may be seen primarily as a research or instructional tool, rather than an art medium.

Digital Art as a New Art Form: An Ontological Perspective

Human beings perceive external information through five senses—touch, taste, smell, hearing, and sight. Through these five paths, outside stimulation evokes internal consciousness. Music is the art form uniquely appreciated by hearing. Most art forms labeled “visual art” are appreciated primarily by seeing, and, in certain circumstances, by touch. Theater and dance usually combine audio and visual effects.

Except for their sensory entries, the main differences between visual art and music are found in their ontological identities. Peter Kivy (2002) argues that a painting can be stolen or destroyed, but music (the performance but not the original manuscript) cannot because a painting is a physical object. Kivy applies mathematical realism to resolve the ambiguities in the ontological definition of music. He suggests that the relationship between a work and a performance of music can be analogized to the relationship between “type” and “token” (p. 211). He takes the number two as an example to show that the type, two, is a real and existing thing; but it is not a physical object. This means it is not locatable in space and time. By contrast, the numeral 2, which was created in a perceivable style, is a token. For Kivy, the work of music is analogous to the number two, the type; and the performance of music is similar to the numeral 2, the token. He claims that this realist view in mathematics can be traced back to Plato, and calls this application “extreme Platonism” (p. 213). John Berger (1977) reflects on this distinction:

For a painter, the original image drawn on the canvas is the unique work that he/she wants to display; any reproduced image becomes a copy. For a composer, the primordial manuscript of the composition is not what he/she attempts to demonstrate; the common audience cannot “hear” rhythm, melody, harmony, and timbre via visual symbols. The composer has to rely on the performers to translate his or her work from the visual score to the audio representation.

Nevertheless, the recent development of computer technology, including its peripheral equipment, has created digital art as a new form; its development is far beyond conventional notions about the ontology of art. If we exclude the works that are intentionally expressed in conventional art forms by using the computer, such as pictures which are printed out, digital artwork challenges the essence of art in many ways. In Dietz’s (2002) essay “Ten Dreams of Technology,” the notions addressed in the first three dreams and in the sixth dream, of symbiosis, emergence, immersion, and flows, interpret the ontological ideas of this new art form in the following ways.

I. Emergence: The Interaction between Physical and Virtual Forms

Digital art is non atom based. Negroponte (1995) points out that the best way to appreciate the merit and consequence of being digital is to reflect on the difference between bits and atoms. A bit has no color, size, or weight, and travels at the speed of light. However, he points out, “Ωwe have been able to digitize more and more types of information, including audio and video, rendering them into a similar reduction of 1s and 0s” (p. 14). Digital art emerges out of non-atom-based phenomena and appears in sensible forms. The work is the type as well as the token, and, if need be, can be transformed into conventional physical objects. Dietz writes that digital works of art “engage in issues of human-machine intercourse as well as the inter-
action of the physical and virtual worlds” (p. 510). He calls this interaction between physical and virtual forms “emergence” (p. 510).

In Ippolito’s (2002) essay “The Myths of Internet Art,” the eighth myth concerns whether Internet art is or is not impossible to collect. This reflects a consequent issue created by the ontology of digital art. Because the form consists of digital signals, its presentation relies on the delicate function of programming. The rapid need to upgrade new generation hardware and software has brought about the problem of compatibility. It is a challenge for artists and collectors to reprogram old data to become readable through new software and hardware.

II. Symbiosis: The Interaction between Humans and Machines

Dietz (2002) argues that many artists have dreamed of controlling feedback loops—interaction between humans and machines through which both can learn from each other. In traditional visual arts, artists, tools, and media can be explicitly distinguished. The computer has first removed the borders between medium and tool. Margot Lovejoy (1997) points out that most computerized tools can also be thought of as media in their own right. She claims, “All traditional media have been recontextualized” (p. 259). This refers to Marshall McLuhan’s (1967) idea that the medium is the message. By using the computer, artists can now create, store, modify, convey, exhibit, and reproduce their works more easily than they could in the past. In fact, the computer and art brought out the worst in each other when they first met. Negroponte (1995) points out, “One reason is that the signature of the machine can be too strong. It can overpower the intended expression as occurs so often in holographic art and 3-D movies” (p. 223). In brief, the performance of the instrument may exceed the expression of the medium. Computer use in art has a dual identity as tool and as medium. This duality endows digital art with its characteristic interaction between human and machine.

III. Immersion: Beyond Physical Distance and Psychological Distance

Physical distance is the focus of one of the important aesthetic theories of art appreciation in the 20th century. Edward Bullough (1957) claimed that “distance is a factor of all Art” (p. 95). Distance, Bullough argues, enables us to experience art objectively. George Dickie (1997) commented that Bullough ignored the factor of psychological distance. He pointed out, “If there is no such psychological state, this approach is in serious difficulty” (p. 31). Countering this aesthetic notion of physical and psychological distance, Dietz points out that “artists have dreamed of artworks in which the viewer is totally immersed” (p. 510). Now, this dream has come true. In addition to machine functions such as zoom in, zoom out, and pop up, or even the production of panoramic dioramas that alter our sense of physical distance, virtual reality successfully creates an environment of immersion in which the conventional notions of physical and psychological distances are distorted.

IV. Flows: Beyond Process and Product

Traditionally, artworks have been identified as the terminal products of artistic activities. The artist is the person who experiences the creative process; the viewer enjoys the aesthetic experience by appreciating the product. In his dream of flows, Dietz (2002) addresses an ideal in which the work of art is dynamic, malleable, and viewer-participated (p. 512). This idea of flows reflects the fourth ontological characteristic of digital art: The work is not necessarily the product but also can be the process. Negroponte (1995) foresees this trend by arguing that “being digital allows the process, not just product, to be conveyed” (p. 224). That process, according to Negroponte, can be the fantasy of one
mind or of a collective imagination. Thus, the roles of artists and viewers are also juxtaposed. In front of a personal computer, a viewer can choose his/her own mode to represent a work or even to modify an original work.

Digital Art as a New Art Form: 
An Aesthetic Perspective

As Manovich (2002) notes, although other fields of art have established certain critical and theoretical texts, digital art still lacks them. Philosophical explorations can be helpful for a new art form to find an established position in the art world and in the awareness of the public. But even new artists' work can be enfranchised as art even without manifestos of its aesthetic value. Contemporary aestheticians tend to use a more open concept to define art. Arthur C. Danto (1997) points out that the question of “what art really and essentially is” is the wrong form of the philosophical question to ask. He suggests that the proper question is: “What makes the difference between a work of art and something not a work of art when there is no interesting perceptual difference between them?” (p. 35). Similarly, in light of the achievements of the artists who devote themselves to digital art, it is meaningless to inquire whether digital art truly exists. The meaningful question is: “What is the difference between digital art and non-digital art?” Dietz's “Ten Dreams of Technology” and Ippolito's “Ten Myths of Internet Art” reflect on this question.

The 15 items of dreams and myths, which remain after excluding the 4 dreams and 1 myth that I ascribed to the ontology of digital art, can be ascribed to four categories. The first category refers to the basic properties of the concept of digital art; the second category refers to the range that digital art encompasses; the third category indicates the causal relationship between artists' intentions and viewers' reactions; and the fourth category points at the consequential style of digital art resulting from its basic properties. These four categories can be associated with the four moments—quality, quantity, relation, and modality—that Kant employed to define the concept of the judgment of taste (Guyer, 2000). In order to set up a more structural concept of digital art, I borrow these four moments to reframe Dietz's and Ippolito's ideas. However, the content of the arguments is basically not Kantian.

I. Quality Moment

The quality moment is the basic attribute of the concept of digital art. Ippolito flatly excludes design and innovation from the realm of artistic activity in his sixth and seventh myths. This notion, mentioned previously, of separating art into liberal art and mechanical art derives from Kant's aesthetics. In ancient times, arts and crafts shared the same definition. Even some contemporary philosophers do not agree with the idea of separation. Susanne K. Langer (1953) argued that all making of expressive form is a craft; the normal evolution of art is in close association with practical skills. Patrick Lighty (2004) also points out that the online arts, which are created using most up-to-date prepackaged programs in the 20th century, have blurred the territorial boundaries between art and design. The degree to which artists or the public accept the idea of the separation of art and design would be a valuable survey topic. Nevertheless, through its multiple video/audio processing functions and effective communication capacity, computer technology has made it possible to contain traditional creative activities and generate a new art form.

II. Quantity Moment

The quantity moment concerns the range of digital art. Ippolito argues in his first and fifth myths that the Internet is not merely a medium for delivering miniature form and is not limited to display via the World Wide Web. Powerful programming functions and multiple video/audio processing abilities endow the computer with endless possi-
ilities. In his 10th dream, Dietz notes that artists were the earliest participants to boldly explore the Internet's capabilities for alternative purpose and to recognize its potential. This infinite potential is explicitly expressed in Dietz's 9th dream, in which he argues that it is not easy to use a pre-existing model to define digital art.

The extent to which digital art can exist depends on the capacity of the computer and its peripheral devices. However, in the third myth Ippolito argues that making successful Internet art is not only a matter of using the right tools, but—what is more important—a matter of having the right attitude. He emphasizes that expensive equipment and special training are not necessarily required, though more sophisticated equipment and software can actually benefit artists' work. Thus, digital art is full of potentiality; by using limited physical devices, artists can create spaceless and timeless works of art. However, time is an important aesthetic and physical aspect of digital art.

III. Relation Moment

The relation moment focuses on the causal relationship between artists' intentions and viewers' reactions. It is controversial whether or not art's prescribed purpose necessarily coincides with the artist's intention. Kant rejected the notion that art has a purpose or end. However, that a work of art might evoke some effect is inevitable; by using Kant's definition, this effect is art's "purposiveness," which means "the causality of a concept with regard to its object" (Guyer, p. 105). Dietz brings up two extreme phenomena in his fourth dream, the dream of world peace; and eighth dream, the dream of the other. The former proclaims the coming of a new community-based world of art, wherein artists and the audience are led to greater understanding through efficient worldwide interaction. The latter describes a mental effect in which the psychological inclination of the alter ego can be easily evoked through typical contact in a private but interactive cyberspace.

Today, artists possess a more powerful medium than ever before to spread their beliefs and ideologies. Dietz's two dreams provide an important message that purposeful intentions, which are opposite to pure visual expressions, have become an important aesthetic value in the digital-based artworld.

Computer technology also reshaped traditional relationships between artists and viewers. A new segregation, based on the polar attitudes of accepting or rejecting digital art, has become another phenomenon interpreted by the relation moment. In his second myth, Ippolito claims that Internet art has actually created a broad appeal and an international following. He asserts that viewers of Internet art sites are distinct from visitors to traditional museums and galleries. However, without further empirical studies, this assertion seems arbitrary. Ippolito's fourth myth addresses the idea that a "digital divide" is not the result of Internet art. Nevertheless, recent research conducted by Gili S. Drori and Yong Suk Jang (2003) indicates that global inequalities in access to the resources and capabilities of information technology are becoming serious. Increasing cross national differences are establishing a new geography of global centrality and marginality (Drori & Jang, 2003). It is problematic whether Ippolito's two examples—the achievements of artists from the geographically marginal countries of Slovenia and Korea—are sufficient to substantiate his argument or not. However, a new landscape of the world of art is forming. This change is derived from people's different experiences in the use of computer technology and their attitudes toward digital art, and ultimately results in new discriminative groups of artists, viewers, and outsiders.

IV. Modality Moment

The modality moment refers to the consequential feature of digital art. Transparency and open work are two features that Dietz describes in his fifth and seventh dreams. Transparency indicates a tendency to
present life as art. The concept of open work stresses the fact that once work is displayed or performed on the Internet, it allows viewers to add comments or to argue for censorship. Both consequences result from the characteristics of real-time reaction and nonlinear interaction through the Internet. Ippolito’s 10th myth emphasizes that viewing Internet art is not a solitary experience. When lingering in a real-time interactive cyberspace, an individual browser is in fact participating in a synchronous social activity.

Ippolito addresses the commercial value of Internet art in his 9th myth. Unlike physical objects, such as painting or sculpture, works published on the Internet become free work which can be shared by the public. Thus, Ippolito encourages us to establish a putative value, which is independent of the traditional exchange economy, to Internet artworks. How to commercialize Internet or digital art is another issue. However, Ippolito’s argument highlights the difference between traditional artwork and digital art.

**Summary**

Anne Morgan Spalter (1999) points out that “no other art medium is bound to a technology that changes as rapidly as the computer” (p. 3); computer technology has exceeded almost any invention in human history. No matter if the term “digital art” is popularly accepted or not, the revolutionary effect of computer technology on visual arts is an overwhelming trend that contemporary artists and art educators can hardly avoid.

In this philosophical inquiry, I attempt to find an appropriate position for this new art form through both ontological and aesthetic arguments. Ippolito and Dietz give a detailed interpretation of digital art from two different perspectives. Though I have tried to reframe their interpretation using four dialectic moments, I have not generated conclusive definitions in each moment. Doing so would be difficult. As Manovich points out, the development of computer technology is so unprecedented that “[n]o critical text on digital art has achieved a familiarity status that can be compared with the status of classic articles” (p. 567). However, I suggest that digital art is different from traditional art in its open quality of integrating different creative styles into a new art form; its potential quantity of creating endless possibility through powerful computer technology; its new interpretation of the relationships between artists and their viewers; and its typical expressive modality which resulted in new evaluations of art’s social and commercial value.

**Endnotes**

1. This paper is modified from one section of the author’s dissertation (Lin, 2004). I extend my appreciation to Dr. Karen Keiler-Boyd, who inspired me with the basic conception of the arguments and provided feedback to several drafts of the manuscript.

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