In this issue:

The Iconic Computer Interface as Cultural Artifact: Its Role in Maintaining the "Status Quo"

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This issue is on the Internet at **http://isedj.org/5/10/**

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ABSTRACT

The following is a philosophical consideration of the computer, particularly the graphical user interface (GUI), as a cultural artifact. Basing the examination on the premise that the computer is *not* a neutral tool but, rather, is an extension of the society creating it, I review potential pitfalls associated with the GUI. Particularly, the GUI can act to relegate computer literacy to a status of usability, rather than conceptual knowledge, and it can also function to further marginalize individuals outside the membership of the dominant culture. Our current notions of "computer literacy" must be revisited under the scrutiny of the computer, particularly the GUI, as a cultural artifact that acts to re-perpetuate the dominant culture's standards and mores. As instructors, we need to be aware of these inherent detrimental aspects so that we can empower our students to control the tool we call the computer, rather than vice versa. This paper seeks to raise questions and awareness of potential pitfalls and issues that we, as educators, need to address in our classrooms.

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1. INTRODUCTION

There is much discussion occurring regarding the development of a "computer literate" society. Our capitalist economy expects and, to a large degree, presupposes computer literacy within both its workers and its consumers, just as it does with requirements of verbal literacy. Teachers at all grade and academic levels of our educational systems are required to develop curricula that integrate technology into their classrooms. In higher education, we struggle with content for core computer concepts courses that will provide the needed skill set that will empower, rather than frustrate, our students in their interaction with our technology-driven society. In this struggle, however, we also must be aware of the political interests inherent in the computer, particularly within its graphical user interface (GUI), which seek to maintain social stasis.

The greater cultural system requires a defined society in order to re-perpetuate itself.

The GUI brought computer technology to the masses, and that interface is an excellent medium for defining society for two primary reasons. For one, the GUI fosters a "literacy of usability" wherein it maintains the status quo through a diminished definition of literacy. Without a conceptual awareness of the political underpinnings inherent in the GUI, users remain servants to the underlying economic goal of producing workers. For another, the GUI's symbology presents a virtual world based upon that of the dominant class, implying, through lack of choice, that this world is the one which is important, the one to which all users must strive. In general, this virtual reality alienates a large group of users, including users of color, users from non-English speaking backgrounds, and users from lower socio-economic classes, who must either assimilate these ideals or be shut out of this world. In the classroom, this affected group of users also includes all students, by fact that they have not yet joined the professional world con-

structed in the desktop. This paper seeks to examine the impact of the GUI by reexamining existing scholarly discussions around the hypothesis that as a cultural artifact and tool, the GUI is a primary venue for maintaining the stasis of society. The primary purpose is to raise instructor awareness of these issues so that we, in turn, can empower our students to use technology to their advantage.

2. LITERACY VS. USABILITY – WHAT IS THE DIFFERENCE?

What is Literacy?

One stumbling block to our awareness of the political implications within the graphical nature of the interface lies in our very terminology to describe our relationship to technology: computer literacy. The advent of computer technology into humanity's everyday life provides us with easier access to information and an easier way to manipulate that information, given that the individuals using the technology are "computer literate." But what does that phrase mean, really? I argue the computer is not a "neutral" tool but is, instead, a politically interested construct that reinforces class distinctions and maintains dominant forms of power. In particular, rather than fostering a "literate," conceptual relationship, the graphical user interface encourages us to develop a "user" relationship with the computer, a relationship which then becomes dictated by that computer.

To examine the role the iconic computer interface plays in subverting literacy, we must first attempt to define the concept of "literacy." Nowadays, we are inundated with a mélange of meanings for the term. As a result, we've appended the term with identifiers specific to the "literacy" we are concerned with: visual literacy, academic literacy, computer literacy, technological literacy, alphabet literacy, etc.[1] We are now dealing with what Brandt calls "the piling up and extending out" (651) of the elements of literacy. However, as Kress succinctly states, "the more that is gathered up in the meaning of the term, the less meaning it has. Something that has come to mean everything, is likely not to mean very much at all" (22). And, that is the problem we appear to be having with concept of literacy—the focus is now on the *identifier* connected to the term, rather than on the underlying aspect of literacy itself.

Furthermore, this differentiation of various types of literacies under the broad umbrella of "literacy" fails to account for the fact that *all* aspects of these various "literacies" presuppose the existence and acquisition of the term's original context: the ability to *critically* read and write an individual's language. In other words, we must be able to understand abstract concepts behind the symbols of language in order to construct knowledge.

What is a "Literacy of Usability"?

The notion of a "literacy of usability" implies a shift in what we consider it to mean to be "literate." As a general construct, this means that literacy is now defined as one's ability to interact with a particular medium or idea, rather than being a state characterized by conceptual knowledge and abstract thinking. This logic applies to the GUI because the icons largely remove conceptuality from user interaction with the computer. By removing textual semantics from the users' relationship to the computer, functionality is emphasized over assimilation of knowledge. Users "point and click" without the basic understanding of "why" or "how," and as a result, they become servant to the tool. This is evidenced in the classroom and in the workplace whenever a "glitch" arises within an interactive session with the computer.

An emphasis on functionality effectually "shortcuts" literacy aspects of critically "reading, writing, and communicating" by going straight to the role of "user," instead. The very term "user" to refer to our interaction with computer technology is very telling. A musician is not a "user" of an instrument; an artist is not a "user" of paint; a writer is not a "user" of a pencil. Yet, we are "users" of computers. That critical relationship of empowered intellect to medium of expression is missing in our relationship to computers; as a "user," we merely acquire a (socially determined) skill set that allows us to successfully complete the task at hand. Efforts to reinforce this technological skill set are causing contemporary American society to also view literacy as a skill set of "socially neutral and context-independent aptitudes" that underlies its participation in politics and the economy (Collins & Blot, 2003, p. 83).[2] Thus, literacy appears to be characterized by successfully appropriating the dominant cul-

ture's definition of achievement, which is measured in economics, rather than in intellect. Today, it seems, *literacy* is synonymous with *employability*.

The functional definition of literacy – a "literacy of usability" – allows the iconic interface to reinforce the capitalist status quo of marginalizing the populace, which includes ethnic groups, women, and the poor, but also—and perhaps more surprisingly—the bulk of the white-collar working class. (When operating from a state of functionality, lower members of the dominant class also become cogs in the political machinations of maintaining the status quo.) This marginalization is accomplished in part by the appropriation of our visual tendencies in order to create what I contend to be a key aspect in the literacy of usability—a subjugation of the critical thinking skills inherent to literacy in favor of the "skills" of computer usage. In other words, computer literacy actually fosters a populace respondent to, rather than in control of, their interaction with computer technology. The computer's iconic interface, like other "image-languages," fails to produce abstract thought because, as Kay explains, "in most iconic languages it is much easier to write the patterns than to read them (qtd. in Stephens, 1998, p. 65).[3] Hence, the cultural system recreates itself.

3. THE GUI AND THE COMPUTER MASSES

With its "point-and-click" functionality, the GUI is considered "the epitome of good usability design, the great breakthrough that brought computing to the masses" (Landauer, 1995, p. 165). The GUI was the brain-child of computer scientist Alan Kay, "whose dreams for the future of the computer, inspired in part by Marshall McLuhan, included a major role for images" (Stephens, 1998, p. 59). Kay recognized, from educational theory, that icons help people to "recognize, compare, configure," and he hoped to use images to "express abstract thought" (p. 64). He envisioned a "kind of language of images" (p. 64), wherein each icon used on the screen would be "worth not just a word but a whole sentence" (p. 59). The combination of menu items and icons allowed the GUI to bring computer technology to society, and it established the computer as a cultural artifact by removing the obstacle of learning the complex syntax and

grammar of the command-line interface. It has also, however, removed the conceptual from our relationship with the computer, grounding our interaction with technology in functional aspects, instead.

The GUI's Transparent Nature

Some research argues that interaction with the GUI is "intuitive," allowing us to "move easily from one application to the next, relying on our sense of metaphor to identify similar functions and to make guesses, building a visual, interpretive intelligence as we go along" (Bernhardt, 2004, p. 422; see also Landauer, 1995, p. 121). Barthes (1977), though, argues that, with the exception, perhaps, of basic pictographs, the relationships between sign vehicles and their referents must be learned. When considering the GUI, then, this means the icons of the computer interface require the user's ability to interpret conventional (a file folder) and unconventional symbols (an arrow). As with all symbols, iconic code contains rules – for use and for application. Thus, interacting with these icons requires training and practice. To acquire these rules, users build a mental model, what Heim (1999) describes as a "set of inferences concerning the underlying movement of the system," which allows them to develop a basis from which to interact with the system (p. 133). This "set of inferences" is enhanced by the fact that even though applications utilize the iconic interface differently, conventional design standards are emerging, which Bernhardt (2004) claims allows the "reader" to make "an easy transition from one application to the next, from one system to the next, relying on learned strategies" for interacting with on-screen data (p. 423).

Such emerging design standards are a boon for promoting functional computer literacy. Gone is the necessity of having to learn precise verbal phrases and type them into the command line interface. But, also, gone is the need to "think" about the interaction. As Chandler (1997) argues, every medium "is constrained by the channels that it utilizes" (p. 3); this includes, by definition of it as a medium, the computer interface. As a graphical mode of communication, the computer interface necessarily facilitates some forms of expression while inhibiting others. Text strings representing actions and commands are replaced by images. The icons

represent the text strings. But, why should a file folder represent "open"? We interact with the interface without considering the underlying systems at work in its representations.

If, as McLuhan (1964) argues, "the medium is the message," then the message of the computer interface is one of complacent usability. McLuhan defines "message," in this often-quoted phrase, as referring to the "change of scale or pace or pattern" that any medium or technology "introduces into human affairs" (p. 8). Societal norms, then, are created and reinforced by the messages in the GUI. Furthermore, we can apply Feenberg's (1999) argument here – that "technical action controls its objects" through their own laws (p. 205) – and define this concept of the GUI as a social artifact further: The changes computers bring to human affairs is one of managing and controlling individuals by encouraging limited user interaction with and understanding of the political interests inherent in interface design.

As a result, though the iconic computer interface allows non-programmers access to technology in a way the command-line interface never could, the limited functionality of the GUI also acts to recreate preexisting cultural conditions that appear inevitable to users simply because of a lack of choice. Such "selectivity" leads to computer usage "having influences of which the user may not always be conscious" (Chandler, 1997, p. 3). The GUI's analogous screens—becoming centered around a set design standard as they are—act to reinforce the transparent nature of computers. These symbols, then—the emerging standard—reinforce a specific dominant culture because, as Stroupe (2000) explains, "iconic" can be defined not only in terms of "visual forms," but also more generally "as a code or style of expression" characterizing popular culture (p. 610). In other words, the GUI's icons are representative of the culture that created them, and that culture has not been a heterogeneous one. As a result, our functional relationship to the computer acts to maintain the stasis of the culture and the distinct class distinctions within it. This power is compounded by the fact that "visual language can move across cultural and linguistic distinctions with greater ease than verbal language" (Snyder, 1999, p. 14).

The computer appears "unproblematic" and "neutral," and the more comfortable we become with its use, the more transparent or invisible it tends to become.[4] Design standards encourage this transparency. Once in place, this visual mode of constructed meaning allows us to move from one system to another without questioning the underlying political structures. Because the standardizing icons and images reflect a dominant membership of society, there is a danger, and probability, that disadvantaged users will be disadvantaged even further and that, in our classrooms, students will blindly conform to the cultural mold.

4. ICONS ARE NOT NEUTRAL

Through symbols given to us as representations of the real world, the GUI presents users with a reality that emphasizes values important to the dominant culture. In other words, as a social construct, the GUI has been developed to meet the needs of a dominant segment of society: a professional culture of white-collar, middle- and upper-class users. As its representation becomes standardized, its biases become accepted as "neutral."

But, the interface is not neutral. We call it the "desktop," an ideologically value-laden term that presents images reminiscent of white-collar offices as representation of the virtual world of the computer. Because users often operate from a state of functionality, rather than from conceptuality, they appropriate the cultural information that these interfaces offer as being "the" representation of the world. As Selfe and Selfe (2004) point out, this reality is

> at least partly constructed from the perspective of, and for the benefit of, dominant forces in our culture. In particular—given that these technologies have grown out of the predominately male, white, middle-class, professional cultures associated with the military-industrial complex—the virtual reality of computer interfaces represents, in part and to a visible degree, a tendency to value monoculturalism, capitalism, and phallological thinking, and does so, more importantly, to the exclusion of other perspectives. (pp. 432-3)

In other words, the icons themselves support certain types of users while discourag-

ing others. The power in these interfaces "resides in the fact that they purport to represent fact—the world, a particular space—as it is in reality, while they naturalize the political and ideological interest of their authors" (Selfe and Selfe, 2004, p. 432).

To have a functional relationship with the computer, then, users must enter a world constituted around the lives and values of the dominant culture. If based upon a merely functional literacy with the computer, a user's "computer literacy" is restricted to the symbolic—the cultural—meaning, a meaning that has been shaped by dominant social forces. By mistakenly presupposing that individuals "read" computer interfaces the same way (see Brandt, 1995, and Smith, 1994, respectively), the GUI reinforces uniformity towards a particular type of user that resists change as it alienates marginalized users.

The assumed user is tacitly defined in terms of corporate culture and white-collar professionalism, as is evidenced in the virtual world of the desktop. Far from being ideologically neutral, the desktop creates a reality representative of the world white middle- and upper-class users know and feel comfortable with (Selfe and Selfe, 2004, p. 433). The standard icons all relate to this white-collar world, though that reality is alien to many users. Johnson-Eilola (1998) uses the folder icon as an example of this alienation: The awareness that a folder icon represents "something to store documents in, and open later, makes sense only if the user has learned how to use a folder in other contexts, such as an office" (p. 208). Such images make it necessary for users interacting with the virtual world of the desktop to incorporate, to some degree, the cultural politics inherent in the interface. This assimilation allows computer icons to construct the users' knowledge by determining what is important – by representation, by inclusion, and by exclusion.[5]

So, while "point-and-click" functionality opens basic computer operations to the general populace, which, of course, is a good thing, as a social construct, the computer is not a neutral tool. Instead, it embodies specific values determined by a dominant power structure. And, it is a persuasive and persistent component situated in practically all aspects of our lives—either directly, by our interaction with it, or indirectly, by its use by other entities shaping and influencing our lives and culture. As a result, the computer and its uses cannot be innocent because, as Feenberg (1999) explains, "the tools we use shape our way of life in modern societies where technique has become all pervasive. In this situation, means and ends cannot be separated. How we do things determines who and what we are" (p. 2). Thus, technological development "transforms what it is to be human" (p. 2) by redefining our internal hierarchy of values to mesh with that of the consumption and production of a capitalist society.

5. WHAT THIS MEANS IN THE CLASSROOM

In the classroom, where we are being pressured to bring technology into every aspect of the curriculum, we need to be particularly mindful of the political machinations inherent in the GUI. The marginalization here can be even more acute, and stasis is maintained in two ways. For one, the majority of students are not familiar with the professional culture objectified within the virtual desktop; some are further challenged by cultural values or a socio-economic status that does not provide exposure to such "white-collar" objects. These individuals need to learn not only the icon, but also the logic behind the icon. As teachers of this iconic system, we are in the unique position to inform our students of the cultural values attached to the icons, as well. By making students aware of the rhetorical motives of iconic discourse, we can help them negotiate the inherent biases in the GUI. Hopefully, this will allow students to successfully employ the computer as a tool without internalizing its cultural stereotypes. Otherwise, students will have to rely on future interactions with their work world to provide them with the "other context" of professional culture—a context that, as noted, is driven by political motives of cultural stasis and economic profit.

Another way the computer in the classroom maintains cultural stasis rests in how students learn to use technology. As a cultural tool, computers "fundamentally shape—and are shaped by—cultural values" so they "continually magnify and reproduce the complex social conditions connected with those values in fundamental ways" (Hawisher & Selfe, 1998, p. 12). The domi-

nant societal class defines cultural values, and reproducing these social values maintains stasis within existing cultural systems. In the classroom, according to some some researchers, socio-economic status determines the role computers play in literacy and the way in which students are taught to interact with technology:

> in schools with large minority enrollments[,] computers are used primarily to provide basic skills instruction delivered by drill-and-practice software. . . . In contrast, computer use in majority schools is characterized by its emphasis on the use of computers as tools to develop higher order literary and cognitive skills as objects of study (e.g., instruction focused on computer literacy and programming). (Sheingold, Martin, and Endreweit qtd. in Selfe & Selfe, 1999, p. 431)

It appears, then, that advantaged groups will be more likely to understand the abstract workings and purposes inherent in their computers' interfaces; they might truly achieve "computer literacy." However, disadvantaged groups—those more likely to become the "working capital" of the capitalist economic system—will be taught only the needed procedures to fulfill their operational roles; their literacy will be one of usability.

6. CONCLUSION

We have probably all heard the saying that "a picture is worth a thousand words"; however, we must not forget this is true only if a person *has* those words *and* has an understanding of them. As Johnson-Eiola (2004) urges, we must take care not to focus on functional, "decontextualized" uses of technology to the extent that we overlook "broader, contextualized communication processes" when instructing our students on computer usage (p. 185). We must be careful, as Mirel (2004) advises, not to fall under the mistaken assumption that "knowing how to operate a technology is commensurate with knowing how to use it to its full advantage to achieve a purposeful exchange of information" (p. 383). And, we need to help users recognize, as Selfe and Selfe (2004) do, that computer interfaces are "non-innocent" borders – physical borders, separating the regular world and the virtual world, as well as cultural borders, dividing the haves and the have-nots (p. 438).

In short, students need to become computer literate in the original, conceptual sense of the term—to become "readers" able to recognize and negotiate the political rhetoric inherent in computers. As educators, it is now our responsibility to ensure our students have the opportunity to develop this literacy. "Literacy instruction is now inextricably linked with technology" (Selfe, 1999, p. 4-5), but we ourselves must first be aware of the extent of the cultural interests inherent in computers before we can guide our students toward an "ability to look critically at ways of thinking, living, and communicating" (Johnson-Eilola, 1998, p. 207). We fail our students if we are merely allowing them to "push buttons" instead of developing conceptual thought processes behind the task they are completing.

Computer technology, specifically the graphical user interface employed with operating systems and application software, acts to maintain the cultural status quo. It does so through replacing "conceptual thinking" with "functional usage" in the notion of computer literacy. And, it does so by presenting the desktop as a definitive definition of what it means to be a productive member of society. While a measure of such stasis is important for societal harmony, as teachers, we also must be aware of the political machinations at work as we present technology to our students. We have an ethical responsibility to provide our students with a conscious knowledge of the societal underpinnings inherent in an individual's relationship with the computer. In so doing, we will help our students to interact with the computer, and other forms of technology, as empowered users—another step in our efforts to create truly "computer literate" human beings.

7. ENDNOTES

1. Kress argues that extending the term 'literacy' to apply to other methods of producing communication—such as 'visual literacy,' computer literacy, Internet literacy, "gestural literacy" "musical literacy", etc.—is inaccurate, because each of these modes encompasses its own methodology of meaning-making (23).

2. Selfe (1999) argues that the focus of computer literacy, in educational settings, is on providing students with "the

means of achieving upward social mobility and economic prosperity within our increasingly technological culture" (p. 6).

3. Lewis (1953) argued years ago that without words, even the immediate and powerful impression of pictures remains "a relatively undirected and inexact medium of communication" (p. 68).

4. This "invisibility" allows culture to perpetuate itself by hiding "choices" from us and is an example of what Freire calls "misrecognition." Being choice-less leads us to "accept the practices and rationalities" of our social positions as "natural and necessary rather than seeing them as ideologically constructed and politically interested. This misrecognition is a form of hegemony that leads people to accept and cooperate with an ideological system which oppresses them" (Herndl, 2004, p. 223).

5. There is an aspect of the "human/technological relationship that says that we can do something about our inventions, refine them, guide them, to perform in ways that suit our sensibilities and needs rather than reform them" (Levinson, 1999, p. 201). This belief is not limited to the masses; scholars, too, argue our "control" of technology. Pointing to McLuhan's efforts to enlighten society as to the effects of our media, Levinson argues we can "continue the effects we liked" and "discontinue or at least diminish those that we did not, after our awakening" (p. 201). However, an "awakening" indicates conceptual awareness—a realization of the "big picture." Levinson (1999) suggests we are becoming a new society of self-learners, a society possibly "moving into an era in which formal education will be obsolesced in many of its purposes and bailiwicks, except insofar as it grants officially-sanctioned degrees" (p. 197). Certainly, members of such a society will perform a necessary function, one wherein the skill set is the primary methodology for success, but to envision an "era" wherein formal education is relegated to a paper mill is to ignore the university's role in research and in extending that possibility of "success" to underrepresented groups.

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