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Introduction

In a mediated society, students are regularly exposed to texts that engage them in continuous processes of interpretation in relation to their daily lives. These texts emanate from a variety of sources including television, film, billboards, magazines, and computers and stand for various cultural (i.e. popular culture, ethnic, etc.), political, gendered, linguistic and regional discourses. The continued growth and use of interactive Internet technologies like the World Wide Web (Web) increase the potential for an even more widespread communication of texts. While the growth in access to information on the Internet is potentially exciting for educators, it raises several issues related to the kinds of representations one is likely to find. For example, if one asks, "for whom (in terms of race, class, ethnicity, gender, sexuality, etc.) is a text designed for?" one may also ask, "how do individuals with diverse social and cultural backgrounds interpret media representations that are not designed for them?".

An issue of growing interest to critical media scholars centers on how the interpretations of images relate to identity formation (Kellner, 1995). Identity formation has also long been an issue of interest to educators, particularly in relation to how identity informs and shapes self-esteem, self-efficacy, and motivation (c.f., Bandura, 1982; Belenky, Clinchy, Goldberger, & Tarule, 1986; Keller, 1983; Noddings, 1992; Turkle, 1995). Media texts, whether still or in-motion, are designed to convey particular messages. According to critical media theorists, how texts are interpreted varies tremendously according to a student's social and cultural positions, perceived, imagined, and/or desired. Given the potential influence of text interpretation on self-esteem, self-efficacy, and motivation and their subsequent impact on an individual's disposition toward learning (c.f., Keller, 1983), educators are increasingly becoming aware of the importance of examining the question: "who does an educational computer program think you are?" Having posed the question, the challenge for those designing and working with educational media becomes to learn how to create educational experiences for individuals positioned in diverse and multiple social contexts.

This paper presents a critical textual analysis of a computer-based instruction and Web-based instruction program that are examined in terms of questions surrounding representations of race, class, gender, ethnicity, sexuality, etc. (i.e. difference). In presenting this analysis, we offer various examples of how a program's and Web site's interface, imagery, and content may position users /learners. It is the goal of this study to think

critically and theoretically about the design of computer-based learning programs and environments in ways that offer greater educational opportunities to people of difference compared to the opportunities offered by current design models.

This paper will describe a textual analysis of the Web (<http://mayaquest.classroom.com/index.html>) and CD-ROM (1995) versions of *MayaQuest*, a yearly (1995-1998) educational experience in which a team of Americans on bicycles travel to various cultures (e.g., Mexico and Central America) and communicate daily via the Internet to students from around the world. These two pedagogical experiences will be analyzed in terms of their *modes of address*, an analytical tool originating from film theory that asks questions about how media addresses certain social and cultural positions in an audience at the expense of others.

Modes of Address

The creation of computer-based instruction and Web-based instruction (hereafter called educational computer programs) interacts with a complex set of design issues driven by the context, content, the structure and navigation of the content, and the people using the educational computer programs. These design issues have been addressed through a number of publications dedicated to the topic of creating educational computer programs (c.f., Alessi & Trollip, 1985). While these publications come from various perspectives based on such issues as learning theory (c.f., Jonasson, et. al., 1995) or the specifics of a particular medium like the Web (c.f., Khan, 1997), they all share a common theme in their desire to create effective and efficient electronically-based instruction; to create knowable, predictable, and measurable outcomes for a knowable and definable audience. Similar issues are examined in work addressing interface design (c.f., Mullet & Sano, 1995; Shneiderman, 1997). Again, most of the work shares a goal of effectiveness and efficiency in design.

Most of the inquiry and design work to date has been guided by pseudo-scientific and positivist perspectives. But other perspectives do exist (Hlynka & Belland, 1991). One can find design perspectives of educational computer programs that are more inspired by the humanities than the sciences. Such perspective engage with a different set of issues compared to the approaches mentioned above. Humanities-influenced perspectives often frame learning as an ambiguous process that lacks certainty and predictability. Working in more qualitative/analytic frameworks like discourse, such approaches allow the asking of questions that have no definitive answers or that generate more questions than they answer (Saveyne & Robinson, 1996). These questions often address fluid constructs like power which are difficult to define but realize material consequence in the ways that people learn in the world (Ellsworth, 1997).

An example of a humanities-based perspective is Brenda Laurel's work (1990, 1993). Unlike most interface design texts, Laurel focuses on the examination of computer interface design through perspectives theorized through an interface's "dramatic structure," that is, the interface as a theatre stage where all representations (human, computer, and their interactions) are present in the same virtual space. Drawing upon her background in dramatic theory, Laurel explores what dramatic structure makes possible for the user of electronically based learning environments. Laurel encourages the designer to look beyond what is on the screen, to begin to examine what occurs in the interaction between machine and human (Turkle, 1995); between text and reader (Fish, 1999).

Laurel's work is helpful in thinking about computer programs from a non-positivistic, culturally sophisticated perspective by addressing such issues as agency. However, it does not offer specific ways of talking about social and culture difference in relation to an interface. A cousin to the theatre world, film studies, can inform our work in the creation of educational computer programs (Ellsworth, 1997). Film theory has a long history of critical textual analysis that addresses media theory in terms of difference based upon issues such as gender, class, race, and sexuality.

One notion developed within film theory that presents strong implications for the design of educational computer programs is known as "modes of address." As Ellsworth (1997) notes (talking initially about film), examining a film in terms of its mode of address equates to trying to answer the question, "Who does a film think you are?" Ellsworth proceeds to apply the notion of modes of address to education. According to Ellsworth, with learning, teaching, and interactivity, the holding environment, i.e., the mode of address, makes all the difference. She goes on to state that modes of address "...are aimed precisely at shaping, anticipating, meeting or changing who a student thinks she is" (p. 7).

The concept of mode of address allows one to trace how power gets articulated to knowledge by the ways interactive media offer particular social and cultural positions to their users. It asks, for example, what does the imagery, language, and structure of an educational computer program make possible and impossible for a student's learning. Ellsworth develops the idea of "mode(s) of address" from film theory to raise questions about pedagogy and to ask "who does a piece of media (or pedagogy) think you are" in terms of one's subjectivities (i.e. race, class, gender, sexuality, religion, ethnicity, etc).

Mode of address is an invisible, "unlocatable" quality of a media piece; more accurately, it represents a relationship - not a thing (Chandler, 1999; Ellsworth, 1997). It can not be described simply as a product of an educational computer program's structure. It is influenced by a complex interaction amongst three factors: textual context, social context, and technological constraints (see Chandler, 1999, for an extensive overview of each factor). Chandler, along with other critical media theorists, discusses the interdependence of the three factors and the importance they play in analyzing media's mode of address. Despite the knowledge of what influences mode of address, it is an elusive state; one can never rely on unchanging, recognizable, locatable and therefore addressable social positions. Therefore, the power of address is not something that one "can harness, control, predict, or technologize" (Ellsworth, 1997, p. 38).

Nevertheless, despite its elusiveness, mode of address can make a difference in someone's learning and their desire for learning. For example, an educational computer program, addressing a student as an "explorer" in a virtual environment creates expectations and desires about what it means to be curious in other learning environments and what can and should be curious about in these environments. Modes of address is an intertextual phenomenon in which addresses and reactions to address are interdependent on the complete media and social panorama to which a student is exposed (Chandler, 1999). Therefore, the mode of address of a particular educational computer program always exist in the context of the other sites and programs that exist, the social context in which they are read, and the technological constraints under which they are viewed.

An important consideration is that, despite the knowledge of influences on mode of address and elements to consider when examining the mode of address of a particular medium, all modes of address misfire. It is impossible to totally know one's audience and control exactly what someone learns. Ellsworth (1997) states that an important pedagogical space can be created in the "difference" between what is taught and what is actually learned. It (this difference) "...bears the traces and unpredictable workings of the unconscious and thus makes it able to escape the surveillance and control by both teachers and students" (Ellsworth, 1997, p. 38). However, educational media designers who believe a knowable student engages in knowable learning outcomes rarely consider this difference. This creates a particular kind of address that one finds in most educational media.

This analysis asks what do texts do when they are meant to mean something because media is always for someone. Reading a text always requires negotiation because there are always multiple entry points into a text (Chandler, 1999). The position that a person takes up in relation to media shifts depending on surrounding and competing modes of address. In order for someone to understand a Web site, they must adopt "the social, political, and economic interests that are the conditions for knowledge they construct." (Ellsworth, 1997, p. 25) They must take up the offered metaphors and structures and negotiate their own meanings. A mode of address constitutes the difference between what could be chosen in terms of content and structure and what is actually chosen. These differences can be "economic, temporal, social, geographical, ideological, gendered, and raced" (Ellsworth, 1997, p. 23). This is where the meanings of text exceed the boundaries of its structure. Audiences exceed and spill over the "acceptable positions offered them. "

Decisions in educational media design are based on (often unconscious) assumptions about who the user is in terms of her or his race, class, ethnicity, sexuality and gender and what cultural competencies s/he possesses. Indeed, designers are trained to gather the information as a part of the analysis phase in the design process (c.f., Dick & Carey, 1996; Smith & Ragan, 1998). Not only does the designer "discover" who the learner is; they also form a generalized description of the learner, seeking to design instruction for a "knowable" learner. The learner, however, is never totally aware of who s/he is; nor is s/he ever fully aware of who the text (or treatment) thinks s/he is. Often, multiple modes of address occur simultaneously in a text, adding layers of complexity to individual interpretations, confounding the intended logic of a text. An approach to design that is attentive to a media's mode of address asks specific questions about how the media constructs its audience's gender, race, class, sexuality, ability, body, health, etc.. This information can then be used to guide the creation of the educational computer program from a perspective that is able to accommodate uncertainty, paradox, and ambiguity.

Modes of Inquiry/Data Sources

We will illustrate how modes of address can affect the use of an educational computer program in the remainder of this paper. While media interpretations are varied, some readings are more likely than others, depending on a media's mode of address. In film theory this process is known as *hailing*, in which a media speaks to specific positions and subjectivities within the viewer. We attempted to uncover some of the subjective positions hailed by two interactive media environments: the Web and CD-ROM (1995) versions of

MayaQuest.

MayaQuest is a yearly (1995-1999) educational experience, in which a team of six "explorers" on bicycles travel to Maya ruins in Mexico and Central America [the latest quests have taken the explorers and experts to Africa (AfricaQuest) and the Galapagos Islands (GalapagosQuest)] and communicate daily via laptop computers with satellite uplinks to (English and Spanish speaking) students from around the world via the Internet. The explorers possess expertise in archeology, environmental studies, Maya history and culture, as well as, telecommunications. Collaboratively, the students and explorers, along with a team of experts (Mayan and Rainforest), endeavor to uncover the collapse of the ancient Maya civilization based upon evidence that the explorers find, photograph, and upload for the students. *MayaQuest* offers a variety of resources for the teacher and the student to assist them with the quest, including message boards for communication, "galleries" for posting writing and art, an extensive library of Web links related to the programs content, and connections to the curriculum areas of Geography, Social Studies, Language Arts, and Spanish. Additionally, there is a "Trek Calendar," in which the explorers post varied text to communicate with the students (print-based reports, video files, images, etc.). Since its inception, millions of children, teachers and others have participated in *MayaQuest* by way of the Internet.

The CD-ROM version of the program attempts to capture the *MayaQuest* experience in a "static" format so that students can engage this learning environment during times other than the 4-6 weeks that the team is in Central America each year. The CD-ROM manual states that it can be used as a tool for preparing students to participate in the on-line experience as well as a stand-alone part of a curriculum. Like the Web-based version, the CD-ROM version of *MayaQuest* has several interactive and motivational elements. For example, the CD-ROM version contains two adventure style games (the Explore and Adventure game) where students try to engage in the same fact finding and problem solving activities as those students who participate in the quest on the Web.

For this analysis, we examined the fundamental characteristic of modes of address by trying to answer the following question: "Who does an educational computer program think that its users are?" The analysis presented in this paper was heavily influenced by Ellsworth's (1997) book, *Teaching Positions: Difference, Pedagogy, and the Power of Address*. Guided by Ellsworth application of mode of address to teaching, learning, and interactive media, we posed four sub-questions to inform an answer to our overall question and to guide our analysis:

1. What assumptions does an educational computer program and its presented metaphors make in terms of the user's gender, race, class, ethnicity, nationality, geography, ability and sexuality?
2. In what ways does the "mode of address" of an educational computer program contribute to unequal power relations and the unconscious formation of individuals in society?
3. How might people "read" an educational computer program that was never specifically addressed them?

4. What elements may make it difficult to "read" particular educational computer programs, assuming that individuals always answer from their own positions?

Who does *MayaQuest* think the learners are?

Assumptions Made in *MayaQuest*

The primary metaphor driving *MayaQuest* is that of an exploration. The explorers and experts take the students on a virtual journey to a foreign land to discover the secrets of an ancient culture. This evokes traditional images of swash-buckling adventurers like Peter Pan or Indiana Jones. It is also a romantic image, one driven by the strong dominating male character.

Dan Buettner, the expedition leader, plays into a reading of *MayaQuest* as a male-centric address. Unknowingly or not, Dan is reflected in the message board by the students as "the man." At one point in the dialogue, several messages are posted with the subject line, "Dan is the Man." The ensuing discussion illustrates the position in which many of the students have placed Dan: the leader, the strong male leading the explorers and students.

Traditionally, expeditions and journeys have been male dominated activities. That the students are reflecting this is not surprising, given Dan's role on the *MayaQuest* team. It is important to note, however, that the team composition also reinforces this notion of the male dominated expedition. Of the six explorers, four are male. The balance is also weighted in the experts, where 21 of the 32 experts are male.

Pratt (1992) discusses how travel writing works to produce a Euro-centered form of global consciousness anchored in the metropolis. The *MayaQuest* team characterizes the environment in which they travel in Central America as a hostile environment to their more civilized sensibilities. They discuss the ways that the environment (heat and humidity) works on their bodies, how their bodies are attacked by insects including ticks and worms. The CD-ROM and Web site include close-up pictures of craters that are left in the bodies of the explorers after they remove parasitic worms that burrow into their bodies. Pratt might characterize the description of the savage effects of the Central American environment on the civilized American body as an "anti-conquest." An "anti-conquest" is a strategy of representation whereby the European bourgeois subjects seek to secure their innocence while they are asserting their European (or in this case American) hegemony. In this case the hegemony is in the power to represent and characterize this environment in *their* terms versus the terms of the environment or its indigenous peoples.

The *MayaQuest* experience addresses the student from a uniquely American perspective. Even though resources on the *MayaQuest* Web site are presented in English and Spanish, it is predominantly a European mode of address that can be summarized as, "Americans travel to a faraway exotic land to send information back home about what they find". This is not necessarily surprising when one examines the race and ethnicity of the *MayaQuest* team. The explorers and experts are predominately Caucasian and Anglo-Saxon. While the literature on *MayaQuest* discusses the cross-ethnic orientation of the programs, this is not reflected in the models presented to the students, nor is it readily reflected in the materials contained within the programs. One wonders how such a mode of address positions the Spanish

speaking students who are located in Central and South America, as well as, the US. The mode of address would certainly be different if the *MayaQuest* experience was designed for students in different regions for example where the "vast" rain forests and "exotic" foods described by the explorers are closer to their daily narratives. What would eating be like for someone after their food been considered bizarre and unusual by one of the explorers?

In *MayaQuest* on-line, the explorers address students informally and in a friendly demeanor. The tone is fun and upbeat (e.g., one of the tag phrases of *MayaQuest* is "Pedals Up!"). It is apparent that the designers of *MayaQuest* want it be a fun and a personal experience with the students and don't want them to feel as though they are lost in a sea of the millions of students that join the quest. Judging by their posts to the message boards, which are friendly and encouraging, students seem to respond well to the tone created by the explorers.

The address in the *MayaQuest* CD-ROM is light and friendly. The text that accompanies the pictures taken by the explorers is informal and conversational and generally spoken from a first person perspective. Even when students lose Explorer or Adventure games, they are consoled with encouraging words to try again. Occasionally, when the user appears to be wasting time, e.g., by spending "too much" time at a particular site, they are reminded by one of the virtual characters in the game that "time is running out." While creating a motivating factor in terms of the game, one wonders about the pedagogical implications of placing such time limitations on learning and how the imposition of this notion of time affects the perception of "learning time" as something that always has time limits.

Mode of Address and its Contribution to Power Inequalities and Unconscious Formations of Identity

The dominance of English on the Internet plays a significant role in how students are positioned and addressed in the *MayaQuest* media. According to Horton (1995), "There is fear that English is becoming the international de facto electronic lingua franca, and people who do not speak English will be at a disadvantage." This concern is important. While the *MayaQuest* Web site presents its content in both English and Spanish, one must look for the Spanish "versions" of the English. They are not presented as peers. In addition, not all of the content has been translated into Spanish; therefore Spanish speaking students are positioned as less important.

Inequalities also exist from a gendered perspective. As mentioned before, the team is heavily male dominated. This occurs not only in terms of numbers, but also positions (e.g., Dan is the team leader; the technology is coordinated by the men on the team). Turkle (1995) discusses the gendered perspective on technology and the potential influences this has on identity. Donaldson (1999) has also examined the influence of gendered images and identity in several areas related to technology. The gender inequity of the *MayaQuest* team and the roles the team members play send clear messages about the effects of gender on power formations to users of the Web site or CD-ROM.

Mode of address describes the processes where certain users of the site are positioned as "other." A great deal of postcolonial literature criticizes a view of the "other" that creates stereotypes based on partial information. Bhabba (1994) calls stereotypes "a substitute and a shadow" of the other. A discussion related to an ethical decision helps to highlight the

position of other, and to reinforce the Euro-Centric focus of the program. At one point in the journey, Dan is faced with a cultural dilemma: the Mayans do not like having their picture taken because it "takes away a part of their souls." The decision to take or not take pictures of the Mayans is an important one, one that directly affects the Web site and the CD-ROM versions of the program (both rely heavily on visual images). Dan poses a question to the message board and asks the students to guide the decision of (1) whether to take pictures with permission, (2) whether to "grip it and rip it" or (3) pose another solution. Overwhelmingly, the students advised the team to seek permission for the pictures, advocating a respect for cultural differences.

Of note is that Dan posed the solution of "grip it and rip it." Dan argued that the pictures were important and that he would only select pictures for the programs that would reflect positively on the culture. In making this decision, Dan demonstrates this dominating position as well as his lack of respect for the culture. Again, this demonstrates the inequalities re: power structures.

Travel writing often creates interest by highlighting difference and exoticizing this difference. In looking at the Spanish conquest of Mexico, Todorov (1982) notes three aspects to the relationship between self (dominant) and other: 1) value judgments (good or bad) 2) social distance (physical or psychological distance) and 3) knowledge (of the history and culture of the other). Positive value judgments, low social distance, and sophisticated knowledge of the other are generally associated. Historically, he notes, difference has been more feared than appreciated [or perhaps thought ridiculous, as demonstrated in the picture dilemma discussed above] with the exception of the phenomenon of exoticism, where the other is considered strange and beautiful.

This exoticizing of the other is quite prominent in *MayaQuest* where the words "exotic," "strange," and "unusual" are peppered throughout the Web site to describe the foods, animals, peoples, and plants encountered during the expedition. In analyzing the programs, it was interesting to note that the descriptions of the landscapes are very positive (e.g., beautiful, lush, vivid colors). In contrast, the depictions of the people position them as destitute. For example, in one of the Kid's Profiles sections, Maria is introduced. Maria is depicted as unusual for a child: she works hard everyday, was not able to start first grade until she was nine, and only has a headless Barbie doll with which to play. Pratt (1992) uses the term "Contact Zone" to describe encounters where peoples geographically and historically separated come into contact with each other. She characterizes them as relations involving, "coercion, radical inequality, and intractable conflict." A "contact" perspective, "emphasize how subjects are constituted in and by their relations to each other." In the case of Maria, the inequalities were not only clearly described, they generated sympathy in the students (as demonstrated in several postings to the Message Board). The result: a decision to assist Maria in her "plight" (e.g., replacing her Barbie, sending her schoolbooks, etc.).

Readings When the Reader is Not Addressed

When the mode of address does not match the person's position, it is difficult, if not impossible, to read the message being conveyed. While some advocate that the text is read and interpreted from the position of the reader (Chandler, 1999), there are instances when language can present barriers to interpretation (e.g., when the language of the text is not the

native language of the reader). The result may be a mis-reading of the text due to lack of comprehension; a reading may take place, but the message may be lost in the translation.

The language in several of the information pieces posted by the *MayaQuest* team can serve to illustrate this point. In reflecting back to the assumptions of the metaphor and inequalities in positions, the models depicted by the *MayaQuest* team reflects an American middle class orientation to viewing the world. In reading the descriptions of the team members one finds that most have advanced degrees and hold jobs at universities, colleges, or research facilities. Some of the words used in the stories reflect their cultural positions. For example, the teeth of a Shaman are referred to as "milk duds." When discussing non-compliance to authority by the ancient Mayans, the speaker says they would have been "dead meat." These phrases are very much a part of the American culture. However, they would likely not translate well in non-American, non-middle class, non-English contexts.

Conclusions

Understanding the implications of the message(s) conveyed by the images and structure of computer-based and Web-based educational programs is becoming increasingly important in educational environments where multiple social positions based on race, class, ethnicity, sexuality, gender, etc. influence the learning process. Having the tools (i.e., language) to demonstrate how an educational computer program positions users/learners, creates an awareness within the educational research and media design communities that can not only impact the way that educational computer programs are studied but how they are created. Looking at an educational computer program's *mode of address* provides researchers and designers with the means with which to analyze and create these positions. Although *mode of address* is difficult to technologize and package into a definitive set of guidelines it offers something that is equally as valuable, a perspective from which to ask questions. This perspective is sensitive and curious about what educational media do and don't do when they are meant to mean something.

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