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Rethinking Digital Literacies and Learning

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Abstract: Using concepts from the New Literacy Studies and theories of situated learning, along with an analysis of computer gaming, this paper argues for the need to rethink dominant views of adult literacies and learning in digital contexts.

Purpose

Various forms of computer-based, or digital technologies are rapidly becoming a part of many adults' lives in industrialized nations. The use of digital technologies in adult education is increasingly widespread. Examples range from the use of Powerpoint and videostreaming to enhance formal presentations to web-based course listservs and bulletin boards to instructional software and simulations. Digital technologies also have become an important resource for informal, self-directed learning, for example as adults use the web to search for information and to consult with others.

Advocates claim that digital technologies offer adult learners a wider range of convenient, motivating, and presumably more effective learning opportunities. Another argument for incorporating such technologies into adult education is that the mastery of digital literacies can be crucial to adults' success in accessing information important in their work, family, and community lives. For instance, the types of jobs with higher economic and social rewards now tend to be those that provide "symbolic-analytic services" requiring the use of multiple forms of oral and visual representations, problem-posing as well as problem-solving, typically associated with the use of new technologies.

Most formal adult education (as well as K-12 education) has not begun to take advantage of the wide possibilities afforded by digital technologies. Much web-based instruction consists of information presented as texts, pictures, and in some cases, videos. Hypertexts offer some opportunities for learner-directed, nonlinear acquisition of information, but in many educational applications the sequence of learning remains linear and hierarchical, determined by the instructor and designer. Efforts to make digitally-based instruction more interactive tend to rely on one-dimensional, text-based environments, such as chat rooms and listservs, which aim to recreate face-to-face discussions. Hodas's (1993) claim more than a decade ago still holds true: in education on the whole, new technologies tend to be assimilated into traditional classroom practices, rather than making any significant impact on the goals or organization of instruction.

Some scholars argue that educators need to give more attention to how digital technologies might be rendering conventional conceptions of literacy and learning obsolete (e.g., Cope & Kalantzis, 2000; Lankshear, 1997; Perelman, 1992). In this paper, I argue that adult educators and scholars should begin to think more expansively about the affordances of digital technologies, the kinds of literacies and learning that are possible with such technologies, and their implications for adult learning and teaching. I will use examples associated with one popular computer game, *Rise of Nations* (Big Huge Games, Inc., 2003) to make abstract concepts more vivid and concrete. While computer gaming might seem far removed from adult education, other scholars have begun to explore computer gaming outside of formal educational contexts as valuable and intriguing domains for developing new insights about literacy and learning in virtual environments, in part exactly because they challenge our current assumptions about learning (Gee, 2003; Lankshear, 1997; Papert, 1980). (Note: I will use the term "computer gaming" to reflect my example of *Rise of Nations*; however, video, or console-based games have been included in other scholars' analyses.

Theoretical Perspectives

The theoretical framework for this paper is drawn from the work of scholars associated with the New Literacy Studies and situated theories of learning. The work of scholars such as Lave and Wenger (1991), Resnick (1987) and others suggests the importance of a *situated* approach to understanding learning; in other words, giving attention to how individuals interact with particular contexts, such as in the use of tools and their relationships with other people. While such perspectives on learning have begun to receive more attention in adult education, they have not been widely used as a framework for the understanding or design of digital learning experiences.

My analysis is based on a related assumption that literacies, digital or otherwise, go far beyond discrete reading and writing skills. To better support adult learning in digital contexts, educators must understand how the specific demands, affordances, and meanings of digital “texts” are related to and shaped by broader practices and communities (see, for example, Cope & Kalantzis, 2000; Gee, 1996; Lankshear, 1997; New London Group, 1996). How people construct meaning from texts is central to such conceptions of literacies. Furthermore, understanding literacy – and learning – as meaning-making must include broadening our definition of “texts” to include multiple forms of representation such as those that involve not only language but also visual images, such as pictures and diagrams, auditory and spatial modalities (Cope & Kalantzis, 2000). The rise of new technologies has provided impetus and focus for this scholarship that has been described as the New Literacy Studies.

More specifically, I draw from and build upon Gee’s (2003) application of such sociocultural theories of learning and literacy to the context of computer gaming. In particular, I develop the concept of semiotic domain as a means of understanding how the technology of computer games is exploited to support the learning of a complex “set of practices that recruits one or more modalities (e.g., oral or written language, images, equations, symbols, sounds, gestures, graphs, artifacts, etc.) to communicate distinctive types of meaning” (Gee, 2003, p. 18).

Computer Gaming: A Not-So-Marginal Example

The appeal of computer games is evident in their widespread popularity, which also makes them a technological site worthy of examination. Computer and console game playing has grown to be an \$8.9 billion dollar industry in the U.S., generating far more revenue than movie box-office receipts or video rentals (Poole, 2000, p. 6). While the stereotypical game player is portrayed as a young, white, male computer “geek,” in reality gamers encompass an increasingly diverse cross-section of the population. According to a gaming industry trends survey, 42% of frequent computer game players in 2002 were over the age of 36 (IDSA, 2003, p. 2). In the United States women now comprise 43% of frequent computer gamers (ibid). The popularity of computer gaming is not confined to the United States; in some European and Asian countries, computer games have become even more of a national obsession. In South Korea, two million people, out of 46 million, have an active account for Lineage, only one of many interactive online computer games .

Despite popular assumptions, not all computer games are violent. A trend in many games is towards reducing or even eliminating violence while increasing the emphasis on problem-solving, plot development, and character interaction (Poole, 2000). Computer games engage players in a significant amount of learning, as players explore new worlds, solve problems, experiment with different strategies, and even take on new identities (Gee, 2003, Turkle, 1995). A growing number of scholars and game designers have become interested in harnessing the power exhibited by commercial games for more “serious” purposes. A Serious Games

preconference held at the 2004 Game Developers Conference included discussion of games on topics as varied as health care education, political activism, team work, and world history.

The game I selected for analysis, *Rise of Nations* (RoN), is what gamers describe as a real-time strategy (RTS) game. As a genre, these games share several key attributes. Players build civilizations, advancing in size and sophistication through accumulating resources, researching new technologies, and expanding their territories. Battles with civilizations controlled by other players – human or virtual – are an important, though not essential aspect of game play. As the name suggests, game play takes place in “real-time;” that is, unlike other kinds of games that allow turn-taking during battles, the players, human or virtual, are simultaneously building their civilizations, and battles can take place at any time, at the players’ discretion. Real-time strategy games involve the constant manipulation of a wide variety of elements, such as creating villagers and soldiers, directing villagers to gather resources such as food, gold, wood necessary to maintain and expand a civilization; constructing houses, military buildings, storehouses and other essential buildings, researching technologies to upgrade capacities and progress to more advanced levels of civilization. Game play is nonlinear and presents the players with an indefinite number of choices about how to proceed. RoN’s complexity, as well as how it is designed to support mastery of sophisticated strategies and problem-solving, makes it a particularly valuable focus for analysis.

Digital Literacies and Learning in *Rise of Nations*

Interactivity, as a core attribute of gaming, is central in shaping games’ affordances for learning. Noah Falstein (1996), a game designer, describes the importance of *purposeful* interactions: “A simple capsule description of a good computer game is ‘A series of meaningful choices to reach a clear goal.’ The choices must be meaningful for the interactivity to be enjoyable.” (n.p.) Early adventure games such as *Myst* were criticized for requiring players to solve seemingly irrelevant puzzles in order to make progress in the game. (How often do educators ask learners to engage in similarly irrelevant exercises?) In RoN, all of the decisions the player must make, and the knowledge and skills that must be learned, are meaningfully connected to the game’s overall goals. Computer games allow players to “learn how to exercise control over an exceptionally rich and sophisticated ‘micro world’” (Papert, 1980, p. 12), requiring not simply functional skills, but an ability to identify the rules and conventions that order the world. In effect, these games reflect and construct semiotic domains that provide a context for learning and give meaning to more discrete skills and information.

The interactive nature of gaming and their associated semiotic domains, also make certain modes of representation more or less desirable, as I will discuss the next section. In RoN, information is designed to be used, and doing itself is a form of meaning-making and learning. The players’ actions create changes in the game space; the game “talks back” (Gee, 2003) and the player must respond. Literacy is thus enacted in the process of gaming, and a view of literacy as practice is particularly apt.

Multimodal and Multidimensional Textual Space

The complexity of images, icons, charts, and text on a typical screen of RoN (see Figure 1 below) can be overwhelming to a novice player. This static image does not even reflect the continuous action occurring during actual game play. In addition to actions initiated by the player, units act on their own: citizens gather resources, scouts explore new territory, military units patrol the nation’s boundaries. The tables and charts change to reflect changes in the nation’s resources as well as in response to the player’s commands.



Figure 1: The RoN Interface

Unlike most formal schooling, learning and playing computer games such as RoN does not require reading and interpreting lengthy narrative texts, but rather are much more dependent on interpreting information presented graphically and visually. Icons present information in a condensed visual form that can be interpreted quickly and that takes up less space on the screen, advantages for learning and acting under time constraints. They are well-suited to a nonlinear, multimodal text space, in which the meaning of individual elements are not as dependent on a prescribed sequence or context (Kress & van Leeuwen, 1996).

Some ideas from the literature on hypertext are useful in understanding how players learn to make meaning of the RoN game space. Hypertext typically is described as a “web” in which various nodes of meaning are interconnected in nonlinear ways. The RoN screen might be viewed in this way; as the player shifts her attention back and forth among various sources of information, sometimes from the center to a chart and back to center, but also from chart to chart. The player not only moves among images and texts in a two-dimensional way; the ability to access new screens of information by clicking on an icon, or change the focus of the center screen, gives the game space a multidimensionality that expands the possibilities for action and interpretation.

Players negotiate the complexity of this environment through the use of patterns and routines, but also through a more spontaneous process of “progressive problem-solving” (Bereiter & Scardamalia, 1993). While the mastery of patterned meanings and actions is crucial, too great a reliance on habitual actions and interpretations can limit the development of expertise in negotiating the complex game space. The game manual, while replete with routines large and small, still includes periodic encouragement for the player to avoid sticking to one favorite

pattern in order to get better at game play. The game itself is designed to allow players to experiment with a multitude of different combinations of competing nations, types of maps, levels of difficulty, and other parameters.

Situated Learning

An adult education truism is that adults want to see the relevance of what they are learning, and are oriented towards immediate application of new knowledge and skills. Gros (2003) suggests that learners need an authentic (but not necessarily “real”) context for what is being learned. In RoN and similar games, learning and application are intertwined, and the relevance of new skills is obvious as they contribute to success in game play. The distinction between learning and playing is intentionally fuzzy; a small number of overtly didactic tutorials are designed as scaffolded game play, while the game itself is designed to support continuous learning. This “hybrid” learning environment resembles Lave and Wenger’s (1991) description of learning in daily life as embedded in engagement in meaningful activity.

A challenge for learners can be the disruption of a sequence of learning followed by doing that we expect from our experiences with formal education. Learners who need a sense of mastery before engaging in the actual activity will be very uncomfortable with this approach, and likely unsuccessful if they fall back on more school-like learning strategies. Memorizing the manual before game play won’t guarantee success, and in fact could well be boring and meaningless enough to deter the learner. Indeed, it is essential for learners to be comfortable acting with limited knowledge in situations that they do not yet fully understand. The game technology reduces the players’ sense of risk by allowing them to adapt the game to support their learning preferences and abilities while reducing penalties for mistakes. RoN removes many constraints on learners’ ability to be self-directed. This degree of learner control is not entirely positive. Learning by playing is by far the most popular approach to developing skills, yet this requires the ability to monitor one’s own game play and modify strategies that are ineffective or limiting. This meta-awareness is not necessarily a skill that all players will bring to game play.

Conclusion

I hope that my analysis suggests the potential richness and complexity of gaming as a site for developing greater understanding of the potential of digital technologies as tools for learning. In some cases, games confirm current theories about learning and literacy, with or without digital technologies. Games also draw our attention to limitations of common assumptions. The multimodal and multidimensional textual spaces made possible by digital technologies place new demands of negotiation and interpretation on both educators and learners. Organization of information or the “sequence” of learning experiences becomes more complex and problematic. Gros (2003), in contrasting typical educational multimedia and schooling in general with games, argues that the design of educational multimedia is still based on subject matter, while games are designed around the player. Game designers seem to agree that a requisite for good game design is “to think like a player at all times.” This sounds remarkably like the emphasis placed on learner-centered instruction commonly found in the literature on adult education. Digital technologies should perhaps compel educators to think like many different players in designing learning spaces that take advantage of the increased flexibility and choices offered by digital technologies. The player’s freedom to innovate is an important feature of games – or other digital environments - that support learning (Provenzo, 1991). And lastly, adult educators should not overlook the role of “productive play” (Rieber, 1996) as a means of learning in these emergent and divergent digital worlds.

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