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FROM SHADOWMOURNE TO FOLK ART: ARTICULATING A VISION OF ELEARNING
FOR THE 21ST CENTURY

by

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A dissertation submitted in partial fulfillment of the requirements
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Major Professor: James Campbell

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ABSTRACT

This study examines mass-market applications for some of the many theories of eLearning and blended learning, focusing most closely on a period from 2000-2010. It establishes a state of the union for K-12 immersive eLearning environments by using in-depth cases studies of five major mass-market, educational, and community-education based products—*Gaia Online*, *Poptropica*, *Quest Atlantis*, *Dimenxian/Dimension U*, and *Folkvine*. Investigating these models calls into play not only the voices of traditional academic and usability research, but also the ad hoc voices of the players, commentators, developers, and bloggers. These are the people who speak to the community of these sites, and their lived experiences fall somewhere in the interstices between in-site play, beta development, and external commentary (both academic and informal.)

The works of experimental academic theorists play an acknowledged and fundamental role in this study, including those of Ulmer, Barab, Gee, and McLuhan. These visionary voices of academia are balanced with a consideration of both the political and financial constraints surrounding immersive educational game development. This secondary level of analysis focuses on how issues around equity of access, delivery platforms, and target disciplines can and should inform strategic goals. While this dissertation alone is unlikely to solve issues of access, emergent groups including the OLPC hold exciting promises for worldwide connectivity. My conclusion forms a synthesis of all these competing forces and proposes a pragmatic and conceptual rule-set for the development of a forward-looking and immersive educational MMORPG.

This dissertation could never have been completed without the support of Dr. Campbell, who unfailingly and kindly offered intelligent and supportive feedback through all my many and unexpected changes in direction. I am forever grateful for his help. On the personal side, I credit my continued sanity to the humor and wisdom of my much-loved Jennies, Mel, Danielle, and Jose. You are amazing.

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INTRODUCTION: CONTEXT AND POSITIONING

In September of 2010, iTunes changed its desktop icon from a compact disc to a deep blue button. This change—while tiny—symbolizes a huge paradigm shift in the music industry. The CD is no longer the guiding metaphor for music. Just as iTunes changed the music industry, new forms of technology will eventually change the entire paradigm of the education industry. However, there is not yet any clear ‘iTunes’ type of product that has transformed the way people think about education. Instead, schools play with different ideas in fits and starts—one trying the idea of in-class clickers, another experimenting with supplemental educational gaming. In the absence of a clear “Gutenberg moment,” it is hard to envision how exactly educators and companies can develop a blueprint for change. The market stands at an odd and paradoxical crossroads, and the transformative Gutenberg moment does not yet seem to have happened.

Although educational technology is not without its critics, there are some compelling reasons to argue for an online approach as a transformative metaphor for K-12 education. In 2010, the U.S. government’s *National Educational Technology Plan (NETP)* proposed a model for a model of 21st century learning guided by the assumption that we as a nation *must* incorporate “state-of-the art technology into learning to enable, motivate, and inspire all students, regardless of background, languages, or disabilities, to achieve” (vi). While the report goes on to describe many very specific ways it expects technology to solve problems in American schools, it gives two overarching reasons why technology is the key to success. The first reason, and one common to almost all modern theorists of eLearning, is that technology is already a significant and core component of students’ lives. The report points out that:

Many students' lives today are filled with technology that gives them mobile access to information and resources 24/7, enables them to create multimedia content and share it with the world, and allows them to participate in online social networks where people from all over the world share ideas, collaborate, and learn new things. Outside school, students are free to pursue their passions in their own way and at their own pace. The opportunities are limitless, borderless, and instantaneous. (*NETP* vi)

The three key terms in the above paragraph are *mobile*, *participate*, and *instantaneous*.

Increasingly, academic researchers are speaking of models that can link students across geographic distance and transform education into an on-demand and networked mobile system. It is exciting to think that the U.S. Department of Education would back such a move, and this concept of an online social network suggests a solution less rigid and constrained than a traditional LMS. The second reason the organization gives for its focus on technology is that it can provide “access to more learning resources than are available in classrooms and connections to a wider set of “educators,” including teachers, parents, experts, and mentors outside the classroom” (*NETP* vi). This vision of the future suggests learning as a collaborative process that occurs in the learner's own time and space, and the traditional classroom teacher is no longer the sole voice of authority. Throughout the report, it seems that the *NETP* actively advocates transformative change based on immersive classroom technology solutions.

Unfortunately, there are almost literally a million possible ways to answer this call to action. As the report itself acknowledges, there are almost as many kinds of approaches to online learning as there are learners. The proliferation of approaches, pedagogies, and types of available hardware (ranging from interactive smartboards to iPads) has created a confusing morass of solutions, none of which actually seem to address the issues the *NETP* has raised. I propose

that—as teachers and publishers—we need to develop a core series of assumptions about eLearning applications. This pedagogical schematic must be flexible enough to take into account emergent modes of online interaction (“check in” apps like Foursquare, for instance), yet educationally solid enough that it does not pander to learners through a quest for surface-level engagement. I propose a specific kind of game model as our solution. The iterative, user-directed, and highly collaborative nature of a MMORPG is well-suited to address not only issues of learner engagement, but also the need for deep and genuine cross-curricular learning. This type of educational game would by its nature be an evolving multiplayer beta—one in which the student and teacher are not restricted to a single linear path—and connections to the world outside the game are not only allowed, but encouraged. In other words, I envision the development of a sustainable and immersive educational MMORPG.

One might well ask why it is important to set out rules for educational MMORPG development. Back in 2006, when I first set out to identify a revolutionary and transformative new model for eLearning, my purpose was not only to define a theoretical groundwork, but also to create and fund a working model of a sustainable ludic environment for learning. In my 2006 proposal, I even specifically defined my intention to “build a working blueprint for a successful eLearning game that would appeal to producers and suppliers as well as to academics.” The overarching goal of this blueprint was to create not only a working theory, but to produce a working model. The idea of a MMORPG seemed both attractive and easy to model on a small scale. After all, how hard could it be?

To borrow a phrase from Susan Engel, context is everything. When I began the writing process, I was still largely immersed in the creative world of graduate school. I worked with the Folkvine team creating nonprofit online art exhibits whose only criteria were that they be both

visionary and engaging. At the same time, I was taking on a role in eLearning development at one of the monolithic “Big Four” U.S. educational publishers. In the early years, my scope there was quite limited—I ran technology for K-5 Social Studies—but I worked under a generous and quixotic boss who encouraged me to think outside the box and design technology components for hybrid programs largely according to my own artistic and pedagogical judgment calls. I had minimal budgets, but I worked with dedicated enthusiasm and envisioned a dissertation and career that looked to a future of avatar-based multiverses, where virtual environments had been crafted to enthrall and inspire learners.

Jump forward four years into the future...and the U.S. economy is mired in a pit of debt and despair. The Big Four became the Big Three as Houghton Mifflin and Harcourt merged into HMH, and the power share of big corporations in the U.S. education market is more monolithic than ever. I now work on all four K-12 disciplines, and I am on the technical end of our custom publishing initiatives. My level of involvement with our digital development initiatives has never been as deep or as far-reaching. *I have never been more uncertain about the future of online education in America.* I tell this story in part because it so aptly illustrates the point we now find ourselves in as a nation. The three institutions of public education, technology, and corporations stand at three very distinct points, and the gulf between them is wider and more uncertain than I could have predicted. Three main forces are at work to create this gulf—on a broad scale, they are economic, political, and cultural considerations. One of the key causes for the many opposing directions in this modern educational mindscape is economic stressors. The American government’s current economic concerns are so well-known, and at the same time so cripplingly complex, that I hesitate to even try to address them here. The so-called credit crunch of 2007-2010 has affected government agencies to the point where schools are struggling. In 2010,

Louisiana alone fell more than \$42 million short on their funding for public education, and the state's lawmakers are "bracing for a \$1.5 billion [state budget] shortfall for the 2011-12 fiscal year" (Deslatte para. 11). In this kind of environment, speculation about the survival of the huge, debt-ridden educational publishers runs rampant. Suffice it to say that this is hardly an auspicious time for companies to invest millions in visionary experimental technologies.

On the cultural side, American students and teachers are still struggling to cope with what seems like an ever-accelerating gap between digital natives and digital immigrants. This issue seems particularly problematic in the field of education, and the *NETP* openly states that "many of our existing educators do not have the same understanding of and ease with using technology that is part of the daily lives of professionals in other sectors" (viii). In fact, I argue that this gap is far from closing. As Generation X grows to dominate the workforce, its understanding of Internet-based digital nativism is supplanted by that of a younger generation who is immersed in mobile, on-demand, and service-based technologies. To stretch the metaphor to its logical conclusion, we live in a world where the digital nation redraws its borders so consistently that few adults can be anything other than immigrants. In this perpetual cycle of digital immigration, our digital citizenships are almost certain to be revoked. It's as yet unclear when or how this process will stabilize.

There is yet another type of cultural paradigm change at work in the shadows of the Internet. Since 2005, collaborative sites and wikis have emerged as a threat to the big publishers. In 2008, the state of Florida approved an open source reading wiki called *Free-reading.net* as "the first open instructional program to be approved through an official state adoption" (Stansbury para. 10). Clearly, collaborative wikis have gained a quite significant level of acceptance in American society. While these collaborative knowledge-sharing sites have the

potential to change the face of the educational market, however, it is still unclear how such a site could function on the grand scale. My own studies have concluded that open source platforms are still tenuous models at best, and subject to the whims of users who have little incentive to share their information. In the case of Free-reading.net, the cost of permissions prohibits it from offering a large pool of reading materials, and it seems so far to have been treated as a helpful resource support site, at best. Like it or not, it seems that developing concrete and widely successful educational technology products is a process which still depends quite heavily on funding from large corporations.

There is another funding possibility to consider, however. On the political side, the twin forces of outsourcing and labor supply trends have put the federal government in a position where it must desperately push for innovations in K-12 science, technology, and engineering instruction (STEM). American students test below most developed nations in math and science, and “a large segment of the nation’s STEM workforce is approaching retirement age” (“STEM Workforce Challenge” 3). The increased focus on applied science and technology is in part a direct reaction to the internal job-security threat posed by outsourcing to knowledge centers in India and China. In such an atmosphere of uncertainty, schools struggle to predict how best to educate students for the future workforce. The only certainty seems to be that the job market will require agile adaptive problem solving skills, and that these skills will quite possibly be tied to virtual or cloud-computing technologies. As this political stake in education rises, the federal government may find itself forced to invest more seriously in educational technology. The catch, of course, is that these technologies would also have to have quantifiable and demonstrable effects on student performance. This is a feat that few educational gaming concerns—with the possible exception of *Dimension M*—have yet to pull off.

Funding aside, there is also the very basic question of what our educational ideal would be in the first place. As Gregory Ulmer wrote, back in the dark ages of 2003, “electrate peoples who experience thought as virtual image will organize collectively in some new way that as yet has not come fully into view” (*Internet Invention*, 8). History suggests, however, that organizational change, particularly on the broad scale, rarely comes into focus except from a vast chronological distance. Historians in the year 2100 may indeed find the patterns and troubles associated with the birth of the Information Age laughably easy to sum up for a class of college freshmen. *What do we do, however, from inside the center of the maelstrom?*

Guesswork is involved—a lot of it—as well as a constant and cyclical reevaluation of the market and its needs. As educational theorists, we must try to envision an application that appeals to students while providing quantifiable and transferable learning gains. This process holds equal measures of fascination and repugnance for the multi-billion dollar publishers in America’s K-12 education market. Although Pearson has proved willing to dabble in the market through its investments in *Dimension M* and *Poptropica*, there are few other examples of publishers backing persistent and successful large-scale educational games. This reluctance is partly because the “ideal” vision must still face off against profit-based investment principles—in this capitalist system, the only motivation for investing the kind of time and money required to develop a truly integrated system is ROI. At the same time, true innovation within online education seems frustratingly impossible while constrained by a profit-based system.

These competing forces have had a profound effect on the way I have re-imagined the scope and purpose of this dissertation. In the end, I chose to divide it into three main segments. The first is an overview of the theoretical history and developmental background of immersive eLearning applications. This is arguably the approach that has remained most stable over time,

since the theory itself has changed very little. I incorporate research on instructional design and MIS, and I even cite the words of bloggers and gamers, in part because they provide the voice of practical and applied experience. Still, the core of my theoretical context revolves around James Gee, Gregory Ulmer, Gilles Deleuze, and Felix Guattari. James Gee still stands as one of the foremost theorists on applied learning in video games, and he has been involved in the development and modeling of both *Dimension M* and *Quest to Learn*. Gregory Ulmer also remains one of my foremost examples of the genealogy of early eLearning theory. While it may seem strange to refer to a book from the mid 2000s as ‘early,’ the designation is apt. In fact, the speed of change in modern technology could term January of this year ‘early.’

The second segment of this dissertation is composed of case studies modeling the development and continuing expansion of major industry models, both educational and mass-market. Through the process of these case studies, *Dimension M* and *Quest Atlantis* have undoubtedly emerged as my industry role models. They are far from the ideal—and numerous proposals in the marketplace sound like they have the potential to do a better and more thorough job of educational transformation—but in the end *Dimension M* and *Quest Atlantis* seem to be the best of what actually *exists* and is available to the general public. As a whole, the case studies also serve as clear examples of the compromises we as educators, publishers, and innovators must make to keep momentum going in the midst of upheaval.

Over the course of these case studies, the third and final segment of my dissertation morphed from the development of a successful eLearning game into a ruleset for development. This change is in part an acknowledgement of the practical blockers to prototype development—to develop even a very simple MMO sample requires a small stable of developers, artists, writers, and testers—but it is also due to a broader applicability goal. Instead of trying to present

a developed sample that solves one educational problem, I have attempted to define a scalable model based on compromises between the tripartite polarization of technology, education, and corporations. The interstices of this mindscape present intriguing and unexpected opportunities for innovations in the way we imagine educational technologies. Rather than a single blueprint for development, it makes more sense to develop an agile and malleable set of learning principles that provide a range of opportunities for application. In fact, I believe this may be the only way—in an age of nonexistent budgets, lowered expectations, and hair-trigger technological change—we can continue our momentum towards the frontiers of virtual education.

CHAPTER 1: GRINDING THEORY REP

In gamer slang, the phrase ‘grinding rep’ refers to a series of time-consuming tasks that are needed to raise reputation with an in-game faction. These tasks—which range from collecting thousands of a certain item, to battling huge elite monsters—seem an oddly suited analogy for the process of building academic credit in the field of eLearning theory. There are different factions in play in the field of modern eLearning, including pure academics, government, and big corporations, and these groups have vastly different goals and interests. Partly repetitive and partly daunting, the process of grinding theory rep with these factions is fraught with uncertainty. Even back in 2003, when I first began my studies in the field, digital learning theory was everywhere, spilling enthusiastically out of the halls of academia and appearing on the shelves of Barnes and Nobles. Among those theorists, there were those who saw eLearning as almost magically transformative, those who argued for specific and concrete direction, and even still a few who saw the advent of the Information Age as destructive to serious pedagogy. With the notable exception of James Gee, however, very few of those theorists were writing from the perspective of lived experience in immersive gaming environments. Some, like Gregory Ulmer and Sasha Barab, wrote from the thoughtful perspective of digital designers, but I still saw a wide gulf existing between theory and practice. This gulf persists today. For the most part, the theorists are not the gamers, and vice versa.

Nor are the theorists CFOs. The financial considerations behind eLearning platform funding are not fully addressed in most academic theories. Ulmer, for example, is far more concerned with constructing an electrated “coordination of multiple discourses and scales, designed individually by each student” than with how he's going to pay for creating such an

arena (*Internet Invention* 137). At the same time, the issue of funding will unquestionably become a serious issue for any mainstream educational game that plans to remain operational over time. While financial concerns aren't, and indeed should not be, the guiding principle for educational theory, the cost of developing such a game—much less a sustainable MMORPG environment—are prohibitive enough that they cannot be ignored. For example, Indiana University's *Quest Atlantis*, which began with funding by a research grant from the nonprofit Macarthur Foundation, now features sponsorship by Food Lion. Much as we as academics may wish to avoid it, corporate backing will be a necessary component of the development strategy for any game targeted to a mass audience.

The idea of a mass audience necessarily widens the scope of my analysis. In the gaming world, innovation trickles downward. Today, mass-market for-profit MMORPGs like *World of Warcraft* implement sophisticated real-time worldplay that in turn influences the development of downstream simulation-based and corporate training platforms. Big money forms the foundation for scope and scale. In 2008, for example, *World of Warcraft* estimated its upkeep costs since launch (just under four years earlier), at \$200 million including “payroll for the entire staff, hardware support, and—apparently the biggest infrastructure cost—customer service” (Pigna para. 2). This figure does not include initial development or launch costs, merely the cost of *upkeep* over a four-year period.

Another important lesson that can be learned from mass-market models, like those of *WoW* or *Halo Reach*, is that users as young as preteens are already at home in the cutting-edge gameplay and graphics of video games and MMORPGs. In the field of education, we are left standing pretty far behind the market. The coolest and most highly-funded simulation-based learning ideas that the U.S. Army and EA Games are currently using are probably the same kinds

of technologies we will see in schools ten years from now. If there is one thing that working for one of the Big Three educational publishers has taught me, it is that innovative digital ideas tend to trickle down last to the field of K-12 education. My focus for practical application has therefore shifted to the lower grades. This decision fits with my own experience—my entire corporate career has been spent in the K-12 arm of HMH, and my field of expertise is more closely suited to that market. However, there is another, more fundamental reason for the shift to K-12. Put quite simply, it is the point where the potential for transformative change lies.

American elementary and secondary students struggle with questions of engagement, so much so that the *NETP* says that when it comes to rethinking online educational models that it “accepts that we do not have the luxury of time—we must act now and commit to fine-tuning and midcourse corrections as we go” (xi). The impetus to move forward at all costs forms an exciting, yet scary framework for application.

The *NETP* acknowledges a core assumption of my own work—that the time to think about ideals in eLearning is past. It would be a serious mistake, however, to plunge headfirst into developing immersive learning environments without understanding the existing options. To understand this market means to first gain a deep understanding of the world of MMO and first-person player gaming. The intrinsic motivating factors at work in the world of gamers can seem impossible for an outsider to fully grasp. As one tongue-in-cheek commentary on *Cracked* says, “give us [gamers] a crystal banana, call it a power-up, and we’ll gladly leap over a robot octopus to get it, even if it means risking a slice of our life pie” (Swaim para. 1). That is why, starting in 2006, I set out to play the mass-market games I had previously only watched. As I gained knowledge of the systems themselves, I also sought out the informal voices of the players on blogs and discussion boards, and an ethnographic theory of gaming developed in tandem with

my academic theory. My goal was—and is—to embody the mandate that Clayton Christiansen, Curtis Johnson, and Michael Horn hold up in *Disrupting Class*: “Most books on the topic of improving schools have reached their conclusions by studying schools. In contrast, our field of study is innovation” (6).

The Self-Indulgent Pool of Slush: Making Sense of “eLearning”

It would be shocking indeed if any theorist could come up with a single, definitive answer to the question of what eLearning means in the year 2010. In an era of proliferating technologies, the process of knowledge acquisition has become a splintered array of pop culture and antiquated pedagogies. In K-12 classrooms all over the nation, students sit and rehearse drill-and-kill standards-based curricula printed in politically correct textbooks. More often than not, even the poorest of these students walk out the doors of their schools and into the fantastic, larger-than-life multimedia world of the 21st century. Batman swoops from the sky in Imax 3D. A man in South Korea playing as a zerg leaps from the shadows to challenge you in *Starcraft II*. Blended music and video streams from mobile devices including iPods, iPhones, and more. Perhaps most importantly, nearly all the knowledge in all the world’s classrooms can now be found by the casual clicks of a mouse through Google. As the *NETP* quite succinctly puts it, the question is now “do we ignore the informal learning enabled by technology outside school, or do we create equally engaging and relevant experiences inside school and blend the two?” (4).

It seems clear that public schools are finding it difficult to make formal learning ‘stick’ in a real and transferable way. In 2006, just a short time after Hurricane Katrina became international news, the National Geographic-Roper Public Affairs Geographic Literacy Study

“found that 33 percent [of Americans aged 18-24] could not point out Louisiana on a U.S. map” (“Study” para. 2). Admittedly, knowing how to find an American state is unlikely to make or break your success in life—unless you are a geographer—and regardless of what popular news stories imply, the ability to name the first ten U.S. presidents is unlikely to determine a person’s ability to function as a productive member of society. Still, it seems clear that public education in America has reached an odd crisis point, perhaps in part because the accessibility of mobile and on-demand knowledge is forcing deep and uncomfortable paradigm changes. The *NETP* points out one such shift when they say that today’s “students come to school with mobile devices that let them carry the Internet in their pockets and search the web for the answers to test questions. Is this cheating, or with such ubiquitous access to information is it time to change what and how we teach?” (4). As this change is taking place, the powerful manufacturing and knowledge capital economies in India and China are also rising to challenge the success of America’s present and future workforces. The assessment of the current system of American education as fatally flawed is simultaneously alarmist and true. For this reason, the key pedagogical question of the day is rapidly becoming how we can engage American students from kindergarten through post-secondary education. The answer is more and more often some iteration of eLearning.

Before attempting to choose from the different theories and approaches of eLearning, it is first necessary to narrow my definition of what ‘eLearning’ is in the first place. eLearning can mean many different things to different discourse communities, and it is difficult to come up with a single concrete definition. According to *Merriam Webster* online, it isn’t a word to define at all. The more progressive Wikipedia defines eLearning first and foremost as something that “comprises all forms of electronically supported learning and teaching,” and then goes on to cryptically add that “the information and communication systems, whether networked or not,

serve as specific media to implement the learning process” (“E-learning” para. 1). This definition somehow fails to fully explain any of the qualities that make eLearning a fundamentally different philosophy of education. The phrase ‘eLearning’ as defined by Wikipedia could be used as a catch-all for a variety of different applications, including but not limited to Internet-based programs, LAN/WAN, CD-ROM, and DVD/VHS materials. For my purposes, it is vital first to distinguish between the remediation of traditional materials and formats online—including PDF eBooks or 150-word count discussion board assignments—and ‘eLearning,’ which for the purposes of this chapter I define as a networked and highly interactive mode of knowledge transmission. If the medium truly does become the message, as McLuhan so famously proposed, then any understanding of eLearning must start with an understanding of the medium that transmits it (*Understanding Media* 7). Interactive multi-user products which create realistic three-dimensional online worlds seem to best realize the theoretical potential of eLearning. It is for this reason that CD-based and install programs are not included in my scope of examination.

In keeping with this angle, many forward-looking companies and institutions have come to define second-generation eLearning as an Internet-based delivery system. What the medium of the Internet actually *means* to users in different geographical and cultural positions has proved slipperier to define. eLearning delivery modes as we know it today live mainly in the interstices of knowledge containment (Google Books, iPad Apps) and modes of dissemination (eBooks, first-person player games, and MMOs/ MMORPGs). For the purposes of this analysis, I will posit a four-tiered structure specific to eLearning games that includes aspects of both educational and commercial games. The first tier is composed mainly of linear and self-contained games such as Harcourt’s *Online Adventures*, which I worked on from 2006-2009. These Level I games are meant to assess comprehension through Flash-based or animated interaction in a simple

narrative template, and knowledge is assessed mainly through multiple-choice questions and drag-and-drop tables. The student can be said to “play” them only in the sense that the game has a nominal narrative—there are only nominal levels, no possible game ‘deaths,’ and only one set linear track. For example, a student in an *Online Adventure* may load goods on a pioneer wagon by answering in the pattern of “*A [wrong answer, try again]; *B [correct answer, a good appears on the wagon].” Very little knowledge is transmitted through a Level I game, although offshoot game elements may include readings or information. *Disney’s Great Piggy Bank Adventure*, for example, contains “Financial Times” newsletters and a “find out more” strategy guide that students can use to learn financial content at a level beyond that of the game.

A Level II game, in contrast, allows for some form of embodied first-person play, multiple game options within a virtual space (in *Dimenxian*, the player can choose to run into the water or down the beach), and cumulative tracking of scores through sustained game levels. While a Level II game may incorporate elements of multiplayer games, such as a leaderboard or top score reporting, it rarely allows for anything other than PvE play. Players do not battle other players, except in the most nominal sense. At the same time, there must be elements of overt self-direction in the game. Players inside a Level II can direct their character to leave the prescribed path—regardless of whether it advances them in the game—and explore areas outside their current quest. In a Level II, there are also clear goals and clear challenges beyond those of the multiple choice/ response narrative. What students do in the game must be able to affect their narrative progression towards those goals in a more sophisticated sense than a simple correct/ incorrect binary.

The concept of a Level III game is still in its infancy in the world of educational gaming. In the public sphere, it is composed of multi-world collaborative games such as *EverQuest*, in

which players have the freedom to form their own player-avatar complete with race, species, and talents. In this type of game there are nearly infinite numbers of subplots and sub-paths generated by the interaction of the characters among virtual universes. There is no one set end goal and therefore no one set plot track. It is analogous in a way to the manner in which a commercial video game player in *Devil May Cry II* can enter a room, see nothing, and have the option of continuing to the next room or stopping to search the nooks and crannies for rewards, extra lives, or magical weapons. The players can choose their own paths based on explorative curiosity or on a specific objective (for example, if you want to undergo the difficult process of killing a demon boss, you can unlock the next level of gameplay). In this sense a Level III game is like a modern version of the “Build Your Own Adventure” books...just with more advanced firepower and more fantastic monsters. Perhaps more importantly, in the educational sphere this kind of game must incorporate some kind of active and original teaching and learning in the narrative. It can no longer function simply as a drill of prior knowledge.

At a level IV game, which has yet to be fully realized in the educational market, the game-world would be pervasive and flexible, built and mediated in part by the players themselves. This movement can already be seen in the for-profit gaming industry, when “video games come with free software, on the disk that contains the game, that allows players to build new extensions (“mods” or fan modifications) to the game or even new games altogether” (Gee *Video Games* 194). In recent years, players in mass-market online games and virtual worlds have seen an increased level of internal customization potential—users are not just working within the existing system, but are instead actually building locations and specialized knowledge systems for themselves. For instance, inside *Second Life*, “the consumer actually co-innovates and coproduces the products they consume. In other words, customers do more than customize or

personalize their wares, they can self-organize to create their own” (Tapscott and Williams 126). Imagine being able to tap into this kind of self-perpetuating beta in a learning module. It is no surprise that both corporations and educators are already beginning to explore the potential of *Second Life* and its alternates. Inside Linden Labs, real-world organizations such as CNN and MIT have established 'campuses' to share and build from their specialized knowledge discourses.

By its very nature, this kind of immersive game must be enormous in both scope and scale. The stakeholders have a role in the Level IV game as well, and these roles would necessarily expand to include regularly-present game designers, producers, and authors. Beyond this, a Level IV game must also be fun to play even when it is educational. Translating mass-market content into educational content in a Level IV game is not as simple as a metaphorical cut-and-paste, because the situated context of a leisure environment has an undeniable effect on the player’s sense of agency. As one researcher from the Institute for Educational Research in Oslo points out, “one could easily imagine what would happen if learning to play *World of Warcraft* became part of the official school curriculum. I would suspect that even though it might be an effective learning environment, many students would find the activity tedious and uninteresting as well as difficult to learn” (Arnseth, para. 32). Indeed, the process of leveling a skill in *World of Warcraft* can take hours of study—both in online ‘help’ sites and through the Blizzard forums—as well as requiring hours of repetitive and boring gathering tasks. Making this kind of process mandatory (and graded) can quickly transform a desirable leisure activity into a distasteful chore. The key to avoiding this trap in a Level IV educational game will lie in three elements: the contextual narrative, the stuff/status reward system, and the element of self-direction. A teacher could not simply assign homework that requires a student to get an Orgrimmar wolf mount in *World of Warcraft* by the end of the month. The key to the quest’s

appeal in the context of entertainment is that the learner has a narrative motivation (a wolf can only be gained when you have exalted rep with this city), that they gain perceived status in the game by being able to ride a mount that few other players have (stuff), and that if they suddenly decide that they would rather hunt for thorium veins, participate in a dungeon run, or even decide to get a mount from a different city instead, they are free to do so (agency).

I would argue that to remain successful in a long-term educational context, a Level IV game must allow the learner all these elements. The transparency of the learned task must be nearly impeccable, and moving through tasks must be a self-directed process with multiple options, rather than a process directed by a teacher. With a straight linear path across a game, the device can start to supersede the plot. Dynamic distraction is also a key of successful mass-market games. In *World of Warcraft*, there are codes hardwired into the game to create unpredictable gameplay experiences. For example, a rare category of monster called the Silver Elite is often encountered at uncertain times and locations because “some have 20 hour long spawns (spawning once every 20 hours), some need to be triggered by killing mobs in an area until the RNG (random number generator) slips the rare spawn” (“World of Warcraft Strategies”). The interplay between timed spawns and RNG allows the game to be played hundreds of times with different and unexpected results, even without taking into account the unpredictable forms of interaction with other live players in the online environment.

Educational platforms will never be able to fully re-envision online educational paradigms until they come to embrace the uncertainty principle in curricula. One possible model for how to approach this problem is to study the existing models in online non-educational (mass-market) games. As Gee points out, one of the most powerful features of video games lies in “their ability to create whole worlds and invite players to take on various identities within

them” (*Video Games* 139). The gaming industry as seen in commercial models has several aspects that complicate the free-Internet model of organization and dissemination. For one thing, games are almost always self-contained. *World of Warcraft* characters cannot wander over the borders into *Myst* or *Spore*. This walling off of the game spheres creates in effect a set of self-contained universes that coexist and often cognitively overlap through a shared player base without ever being able to bleed over into each other. The knowledge sets may have some reuse potential from one game to another, but there is still no Google capability for online first-person player environments. A user cannot type in a search term such as 'goblin,' (or 'calculus' in the educational gaming model), and step directly into the list of all known games with that feature. There is one simple reason for the separation, and that is the commercial model. These games are meant to make money, and to attract and maintain a continuous user base. As long as educational games remain commercialized outside an open-source paradigm, the ownership/fortress modality will almost certainly persist.

Level IV games will also almost certainly result in the development of a discrete subculture with its own linguistic markings: *LOL*. *Bump*. *PWNED*. Linguistic gaps will therefore develop between the creators and users of any given program. If we take for granted the assumption that Prensky's digital immigrants are still the designers of most educational gaming environments, their digital native users may use sets of terms and definitions that are entirely foreign to them. Perhaps more to the point, a true eLearning system by its nature must break the authoritarian paradigm of the professorial classroom. Students online have no physical oversight, and little or no scheduling oversight, two procedural shifts that have an as-yet undefined depth of effect on pedagogy. However, my main area of interest lies not with procedural change, but rather in the broader psychosocial shifts caused by the self-direction of learning and in the

democratization of content. Gatekeepers do not hold the same relative positions as they did in the print world. As David Weinberger puts it, “from the outside the ‘blogosphere’ looks like a self-indulgent pool of slush that wouldn’t get past the usual publishing filters” (102). Learning to value both the slush and the self-indulgence is the key to success in a Level IV game.

From Theory to Practice: Becoming Electrate

The question of how and why to implement eLearning programs tends to inspire emotions ranging from excitement to a deep and sincere skepticism. One of the key points that educators still struggle with is the relationships—and possible pitfalls—that exist between literacy and electracy. In the mid 2000s, University of Florida professor Gregory Ulmer predicted that “while the entire administrative superstructure of literate specialized knowledge will be translated into cyberspace, once there much of it will evaporate. The practices that will replace specialized knowledge remain to be invented. Who will be the inventors? Why not us?” (*Internet Invention* 5). Ulmer’s *Internet Invention* calls for teachers to step outside the realm of hermeneutics to find working strategies that address images and multimedia in college classrooms. In short, he believes we need a new pedagogy that considers the manner in which popular culture metabolizes and produces digital text forms: what Ulmer terms the study of “electracy.”

To develop an electracy, however, the education industry must first be willing to experience a rebirth and re-visioning of its most fundamental practices. While speaking to the proliferation of technology in the last part of the 20th century, Marshall McLuhan cautioned that, “if we persist in a conventional approach to these developments our traditional culture will be

swept aside as scholasticism was in the sixteenth century” (*Understanding Media* 71). More than four decades after McLuhan made this claim, modern society has indeed moved swiftly into a decentralized digital universe. Along with this global movement, academic institutions are undergoing fundamental changes that have the potential to both revolutionize and unseat the structures of education as we know it. This swirling sea of pedagogical and social changes online both threatens and inspires. One thing is certain, however. The rapidity and pace of change dictates that academics must define and shape applications for eLearning, not just through theory, but through practice.

Moving into practice demands a close examination of practical details at a granular level. For example, most online eLearning programs are dependent on RLOs (Reusable Learning Objects), or set templates or scenarios repurposed throughout a class or program. At this point on the technological development continuum it would be cost-prohibitive to create an Internet program with unlimited scope. RLOs are therefore often seen as a good solution because they present “a speculative technical solution to reduce development cost. They address the technical issues of eLearning development and maintenance, but applying objects to all learning and training situations can make designing quality training much more difficult” (Allen 51). The ramifications for eLearning theory are obvious—RLOs place clear limitations on the rhizomatic potential for learners. Yet RLOs need not be seen as highly restrictive, since video games currently use a form of RLO in their structural design while remaining engaging and highly motivational. I believe the problem for educational products lies not in the use of RLOs, but rather in the traditional academic approach to learning—the discourse of entertainment is distrusted, and the RLOs formulated in modern learning games quite often walk a safe and narrow path. Moving frogs from one lily pad to the next does not do much to foster engagement.

Even where educational games do adopt a more mass-market approach to narrative, however, RLOs will still pose problems of player agency. Michael Allen underscores this point through a case study of the video game *Super Mario Brothers*. In a standard challenge-format, the game requires learners to find kickable sections of brick in a wall, and as Allen explains, children playing the game soon “knew *every* opportunity hidden throughout hundreds of screens under a multiplicity of changing variables” (173). He then asks the reader to imagine teaching the same task in a classroom setting, along with thousands of configurations of bricks for students to memorize and count. Allen suggests that “after several years of pushing students through these exercises, the teacher might turn to eLearning for help. With a happy thought of transferring the teaching tedium to the computer, the teacher would create an online version of the same boring instructional activities” (174). RLOs or no, being ordered to kick 1,500 virtual bricks is no more engaging than a traditional classroom activity would be.

The key difference between the eLearning program and the video game is mainly the power of narrative. The story of *Super Mario Brothers* serves as a self-perpetuating motivational context, even for tasks that would be tedious in a classroom setting. The learner can solve tasks in order to get rewards, and ultimately to *win*. Although the visual elements of gaming are relevant—even vital—to learner motivation, they are not the sole key to success in an eLearning application. Narrative brings with it the possibility for transformative experience and character definition. Gee posits that when players take on new identities, “two things can happen: On the one hand, their presupposed perspectives on the world might be reinforced” (*Video Games* 139). The second possibility, however, is that players’ views of the world will be challenged and even changed. In this kind of scenario, online games have the potential to change not just a learner’s cognitive knowledge, but the way they function in the world around them.

Perhaps it is because of this possibility for immersion that online educational games are so often seen as a way to change the problem of the unengaged learner. As Richard Hersh points out, however, “*engagement* [does] not mean simply keeping students busy and interested, but rather expecting them to construct and validate meaning—to make sense of things” (52). Beyond simply being interesting to a student, the game must both teach and reinforce critical thinking skills. The level to which educational games can teach higher-level critical thinking is still a matter of debate. There is a clear danger in the assumption that a technology solution solves educational problems purely by its novelty. Hersh makes the clear claim that “we cannot purchase a well-rounded education for a flat world with new technology, a new standardized test, or an SAT prep course” (53). Why then the focus on technology as a solution in the first place? Theorists seem largely united on the front that the goal of 21st century education is to “teach students to apply knowledge, to think horizontally crossing disciplines and connecting the dots to make sense of the seemingly infinite information available through information technology and media” (Hersh 52). This method of interactive blending, while also possible in traditional face-to-face activities, seems uniquely suited for the online environment. Katie Salen of New York City’s public school “Quest to Learn” program believes that technology opens the door to possibilities beyond what is possible in a face-to-face classroom:

Salen’s theory goes like this: building a game—even the kind of simple game a sixth grader might build—is equivalent to building a miniworld, a dynamic system governed by a set of rules, complete with challenges, obstacles and goals. At its best, game design can be an interdisciplinary exercise involving math, writing, art, computer programming, deductive reasoning and critical thinking skills. If children can build, play and understand

games that work, it's possible that someday they will understand and design systems that work. And the world is full of complicated systems. (Corbett 3)

Critics might argue that the process of building worlds in an online game is no less a process of imaginative creation than a class project that builds and populates a medieval village from Legos and popsicle sticks. To a certain extent, the two kinds of projects are similar. In both scenarios, the students must build entities (whether physical or virtual) that depend on set rules and constraints. However, Salen's game-worlds provide something fundamentally different. The key to difference in the online world is the possibility for fluid and adaptive situational context—inside an immersive game, a student can not only help build the medieval village, but also inhabit and defend it.

The element of simulation is precisely why I posit online immersive games as a forum for building critical thinking. On the simplest level, interacting with a complex game world requires choices based on an understanding of strategic alternatives. Take for example a very simple educational game choice like deciding whether to build the medieval village near a cliff, or near a river. Logical if/ then relationships in an interactive game will dictate that each choice has both a benefit and a cost—building the village near a cliff makes it more defensible but less desirable for farming. As Gee notes, “a video game is problem solving with lots of practice, feedback, and assessment (e.g., boss battles)” (qtd. in “Part I”). The level of critical thinking that deals with problem solving and cause/ effect relationships is very aptly illustrated through the simulation in the game. Instead of imagining what might happen if their village did not have enough food, students could actually see their villagers leaving, then try to plan and enact a solution that would entice them back. This illustrative style of cause/effect strategy is mediated in MMO environments by a level of social consciousness. There, the players deal not only with the

scripted events of the game, but also with a set of complicated and strategic relationships between real people. For example, the leadership in an MMO guild group will make or break its success thanks to the way they manage the other players in their guild.

Beyond this level of critical thinking, which extends into both narrative-based and player-based interaction, there is a second level of critical thinking possible around a game. This level of meta-thinking reads the game world itself as a cultural script suffused with the real-life values and assumptions of its creators. This kind of layered self-reflection is unlikely to be naturally pervasive in public school classrooms, inside or outside of a game, but I would argue that the process of *building* elements of such a world—the student as prosumer—more easily lends itself to this level of thinking. Moreover, it would be a mistake to assume that students should roam online educational games free of any outside direction or purpose. Much like any classroom tool, online games must be scaffolded with intermediary pedagogical structure and educator guidance. To teach meta-thinking around the game as self-reflexive text therefore requires little more than educators who themselves understand the nature of what they are trying to teach. Gee notes of Quest to Learn educational gaming that its “mentored and guided problem-based learning is not meant to be an ‘anything goes’ and ‘just let children do what they want’ space. It requires good design and good mentoring from teachers, other adults, and more advanced peers” (qtd. in “Part I”). Just as a traditional classroom might use construction paper pumpkins to teach counting, an online class can structure lessons around discrete and well-defined aspects of the virtual world.

To the same extent that virtual educational worlds must be interpreted and ‘read’ by teachers, they are also mediated and constructed in part by the intelligence and backgrounds of their learners. Immersive virtual worlds are far from a tabula rasa that the gamers enter into as innocents. As much as we may focus on the negatives in education, such as “decreasing use of

the print medium and failing schools,” theorists have noted that “a countervailing trend may come as a surprise: the continuing global rise in IQ performance over more than 100 years” (Greenfield 69). This data seems to contradict the idea that American students are simply unable to deal with critical thinking challenges. Moreover, this rise in IQ performance seems to be tied to a visual mode of intelligence. As Patricia Greenfield notes, “this rise, known as the Flynn effect, is concentrated in nonverbal IQ performance (mainly tested through visual tests)” (69). This visual media literacy is almost certainly the result of extended and regular extra-curricular exposure to such media. When it comes to online educational games, students will bring their visual and experiential digital intelligences with them into the virtual world. In this way, online immersive environments can be said to build upon existing critical thinking skills rather than to create them wholesale.

Beyond critical thinking, there is also a real and very practical skill-based level of development in video game play. Studies of laparoscopic surgery training, for example, have found that “action video game skill (as demonstrated in the laboratory) and past video game experience (assessed through self-report) predicted laparoscopic skills; in contrast, neither laparoscopic experience in the operating room nor years of training significantly predicted laparoscopic skill” (Greenfield 70). In other words, the surgeons who played video games were also almost universally better at the virtual navigation techniques required in laparoscopy. As more professions leverage computer-mediated tasks, and the global workplace grows more virtual, it is quite logical to assume there will be increased overlap between skill-based tasks and video game skills. eLearning thereby becomes less an accidental matter of medium and more a matter of training for the future workforce.

“Soft” Theory: Deleuze, Guattari, McLuhan, and Barzun

Beyond the practical issues of critical thinking and strategic skill development, however, there are higher-level considerations for teaching and learning. Approaches I term ‘soft’ theory seek to engage philosophical questions of identity, ethnography, and significance. In fact, these questions are more applicable to the practical questions of eLearning development than many experts would like to admit. Abstract theoretical perspectives define and delineate the philosophical approach to an eLearning program. For one thing, a linear eLearning program—be it on an install server or Internet-based—is pedagogically alien to the immersive and non-linear gaming experience. This is in part because, as theorized by Gilles Deleuze and Felix Guattari, technological media of their nature have no stable point of entry, existing instead in a type of rhizomatic and decentralized universe. In this sense, the rhizome is an “acentered, nonhierarchical, nonsignifying system without a general and without an organizing memory or central automation, defined solely by a circulation of states” (Deleuze and Guattari 21). Although Deleuze and Guattari write from a completely anti-capitalist perspective, I believe their concepts are unintentionally applicable to a blended academic/ corporate model. After all, application for a source cannot be determined solely by the original intent of its creator. Deleuze and Guattari speak precisely to the Information Age dilemma when they write that the classical, romantic, and modern ages “should not be interpreted as an evolution, or as structures separated by signifying breaks. They are assemblages enveloping different Machines, or different relations to the Machine. In a sense, everything we attribute to an age was already present in the preceding age” (346). The idea of the Information Age as an assemblage enveloping a machine is freeing in the sense that it provides a clear and distinct demarcation between the past and the present—we

may not have to provide rationale for changing past paradigms, because this is not a step in an evolution. Rather, the idea of education in the Information Age is something wholly new and yet to be invented.

In the context of lines of delineation, Deleuze and Guattari note that “we went from territorial assemblages to interassemblages, to the opening of assemblages along lines of deterritorialization” (337). Although they write from a perspective almost 25 years removed from the modern era, the manner in which they evoke deterritorialization echoes the economically-flattening assemblages of the 21st-century world in which we live. The concept of the rhizomatic system can also be applied to educational gaming. Although it is tempting to analyze video games solely in terms of their ‘narrative’ line, I will attempt to focus rather on plateaus occupied by the learner through his or her experience in the game. Video games usually do have a start and finish, but these narrative elements are almost peripheral to the point of the gaming experience. As Deleuze and Guattari write, a plateau “is always in the middle, not at the beginning or the end. A rhizome is made up of plateaus” (21). Because one of my main interests is the rhizomatic nature of learning within a first-person player game, it is the plateaus in which I am most interested. Like Deleuze and Guattari’s rhizome, a video game should operate by “variation, expansion, conquest, capture, offshoots [that pertain to] a map that is always detachable, connectable, reversible, modifiable, and [have] multiple entryways and exits and its own lines of flight” (21). Today, even the simplest commercial video game has modifiable narrative paths with multiple entryways/exits, but educational games quite often minimize the variation/conquest modalities. I argue that this is partly due to the false binary division between structural academia and freeform entertainment—despite its medium, an educational game is only seen as ‘serious’ if it restricts the learner from freeform play.

Creating an online learning environment with this sense of freeform play has the potential to de-center traditional beliefs about academia. Deleuze and Guattari claim that “history is always written from the sedentary point of view and in the name of a unitary State apparatus, at least a possible one, even when the topic is nomads. What is lacking is a Nomadology, the opposite of a history” (23). The process of classroom learning creates a history of its own, one that is in some sense controlled by the unitary State apparatus referenced by Deleuze and Guattari. In its most advanced form, however, an academic video game could write a nomadology of the learner’s own history—ever changing, this game allows for the inhabitation of multiple bodies and the choosing of multiple paths that include different experiences and endings. The truly experiential game actualizes the claim that

There is no longer a tripartite division between a field of reality (the world) and a field of representation (the book) and a field of subjectivity (the author). Rather, an assemblage establishes connections between certain multiplicities drawn from each of these orders, so that a book has no sequel nor the world as its object nor one or several authors as its subject. (Deleuze and Guattari 23)

A well-constructed MMORPG has no possible sequel in the sense that it has no end—it is possible to re-play the original game over and over with myriad different paths and results. As a field of representation it assembles the worlds of the learner and its creators, but at the same time the game allows new worlds to proliferate as the learner gains experience (knowledge). The tripartite division Deleuze and Guattari refer to is shattered in the (dis) embodiment and worldbuilding processes of game playing.

The myriad paths of an interactive game create a ludic environment in which fantasy rules. It is significant that many first-person player games even use language that is similar to

Medieval and Renaissance myths: students undertake ‘quests,’ often to rescue a person or find a modern-day treasure much like a grail. In fact, the rise of educational gaming could signal a break from the preeminence of logical order and a possible return to fantastical world-building in the classroom. The theoretical ramifications of such a shift would be far-reaching. Fantastical narrative in first-person gaming environments can be compared to the egg in Deleuze and Guattari’s *Body without Organs*. As the authors put it, there is “a fundamental convergence between science and myth, embryology and mythology, the biological egg and the psychic or cosmic egg: the egg always designates this intensive reality, which is not undifferentiated, but is where things and organs are distinguished solely by gradients, migrations, zones of proximity” (Deleuze and Guattari 164). Within the framework of a computer-based world, the techno-scientific and the mythic are fused. It is this virtual dimension that can be used to regenerate desire in academia. As Deleuze and Guattari posit, “the BwO is desire; it is that which one desires and by which one desires” (165). I believe it is possible to construct narrative environments in which desire is generated within the disembodied experience of the player; the avatar in gameplay is the ultimate example of a body—whether that of a narrative work or a physical person—without organs at all. Whether or not a new kind of hybrid cyborg ‘organ’ will some day exist within the gaming interface has yet to be fully determined.

Although Deleuze and Guattari do not specifically phrase the BwO as a manifestation of technological embodiment, the parallel is clear. The authors summarize the BwO in its totality by stating that “the identity of effects, the continuity of genera, the totality of all BwO’s, can be obtained on the plane of consistency only by means of an abstract machine capable of covering and even creating it, by assemblages capable of plugging into desire, of effectively taking charge of desires, of assuring their continuous connections and transversal tie-ins” (Deleuze and

Guattari 166). In this case the abstract machine is quite literally the computer, in which programmers create twice-removed representations of the sign through computer-generated virtual representations of landscapes and objects. The assemblages thereby created—an altered hybrid of pictorial images and conceptual fiction—can and should be crafted with an eye to the evocation of desire. The process of learning is from the first irrevocably tied to the desire for knowledge, whether for practical or philosophical reasons. In modern America, however, the element of desire is notably absent from many secondary and postsecondary learning environments. Gaming environments represent a unique opportunity to re-invent this zone of desire.

It is important to note that Deleuze and Guattari claim that the BwO is precisely the opposite of fantasy-narrative. They write that the BwO is “what remains when you take everything away. What you take away is precisely the phantasy, and significances and subjectifications as a whole” (151). The narrative play of gaming, in which the ludic world of the game is constituted almost entirely by fantasy, at first seems at odds with this description. I would argue, however, that this interpretation is a reductive view of how the BwO theory would function in the internet networked gaming environment. In one sense, the game could be said to take away the student’s physical body and substitute for it a blank-canvas avatar. The avatar looking back at you from the *Quest Atlantis* screen is a Body without Organs in its most literal sense.

Although Deleuze and Guattari provide great insight into the metaphorical connections in gaming, the abstract nature of rhizomatic theory stands apart from the inherently practical issues in the development of eLearning platforms. In academia today, there is a conscious resistance to the breaking down of the barriers between print and image-based/ experiential digital texts. In 1964, McLuhan pointed out that “the unconscious depth-messages of ads are never attacked by

the literate, because of their incapacity to notice or discuss nonverbal forms of arrangement and meaning. They have not the art to argue with pictures” (*Understanding Media* 231). There is certainly no longer as radical a resistance to analyzing visual/textual images in advertising. As one study pointed out in 2009, “more than 46% of children 6 to 11 [had] visited a website they read or heard about in an ad” (Bulik). While advertising to children is a topic taken up in more detail later in this dissertation, the paradigm of advertising online is arguably changing.

Literary scholars have no problem arguing with nonverbal forms of meaning, but there is still a resistance to assimilating such forms as flexible and multimodal means of expression. Could literary philosophy be expressed in imagery and sound? Gregory Ulmer believes so, and his concept of electracy asks students “not to wait for the flash of insight, but to write (design) it” (*Internet Invention* 114). Ulmer’s choice of the term ‘design’ is deliberate; in his pedagogical system, the mystory is a digital/textual landscape that constructs meaning out of fragments.

The most exciting aspect of this shift is its effect upon the process of conceptual imagination. McLuhan explains this effect through concrete example, stating that “All the words in the world cannot describe an object like a bucket, although it is possible to tell in a few words how to make a bucket” (*Understanding Media* 158). All the words in the world—or at least a good number of them—have indeed been used to engage and describe literary and cultural theory, but how might visual representation enhance a student’s comprehension? Theory is admittedly a highly abstract case, but it still has more in common with McLuhan’s bucket than we might like to admit. Interestingly, more than forty years ago McLuhan had already visualized digital technology as a movement away from the (visual) printed text. McLuhan argues that “As electricity has created multiple non-visual means of storing and retrieving information, not only culture but science also has shifted its entire base and content” (*Understanding Media* 159). In

today's world of 3-D computer-simulation, however, McLuhan would most likely need to rephrase his argument. To move school boards, teachers, and students into a digital world can only increase the visual nature of the learning environment. In the very near future, I believe that visual matrices for K-12 learning will become the norm rather than the exception.

To develop responsible and pedagogically sound visual matrices, however, it is also necessary to delineate and form systems of definition. Gee writes that “expert practitioners in a given semiotic domain—whether teaching, science, law, business, architecture, art, or what have you—have to form an appreciative system relevant to that domain in terms of which they can evaluate action (probes) in that domain” (*Video Games* 97). Teaching online forms its own kind of semiotic domain, and there is as of yet no clear learning process or appreciative system for this kind of practitioner. By this I do not mean to suggest that there can or should be one set form of learning online for different disciplines. By their very nature, online learning methodologies will differ widely based on purpose and scope.

Regardless of purpose and scope, all first-person player games necessarily involve a performative form of learning. In fact, Gee distinguishes verbal meaning from the first-person experience of gaming. While comparing online and lecture-based learning platforms, he writes that in the latter scenario “the students would have only general and/or verbal meanings, not embodied ones that they can customize to and for different situations of actual practice” (Gee *Video Games* 86). His use of the term ‘embodied’ is important. Much has already been written about the power of avatars and embodiment on the Internet, but the medium is still so relatively new that these theories have yet to be tested over time. My theory of eLearning does not attempt to revise or add to theories of (dis) embodiment in cyberspace, but no analysis of first-person player learning environments can neglect to take them into consideration. I also take seriously

Donna Haraway's plea for a feminist voice in hypertext and technoscience. In *Modest_Witness*, she writes:

I want feminists to be enrolled more tightly in the meaning-making processes of technoscientific world-building. I also want feminists—activists, cultural producers, scientists, engineers, and scholars (all overlapping categories)—to be recognized for the articulations and enrollments we have been making all along in technoscience, in spite of the ignorance of most 'mainstream' scholars in their characterizations (or lack of characterizations) of feminism in relation to both technoscientific practice and technoscience studies. (Haraway 127)

To effect change within a mainstream corporate system is a tricky process that takes more than pure theory and often cannot directly address issues of feminist identity. As both a Texts & Technology student and a corporate eLearning specialist, I have a very real investment in Haraway's meaning-making processes.

Virtual meaning-making processes are complicated by the proliferation of often-damaging stereotypes in media. Even from a feminist perspective, I would argue that issues of gender equality take a backseat to the need for a simpler kind of revolution in the eLearning arena; the resolution of the culture wars in American education. Jacques Barzun's work, while more than a half-century old, speaks to the current divide between intellectual and entertainment discourses in modern education. Barzun boldly states that the educational system in his time "turns out with certainty only two products—complaints and cripples," and goes on to posit that educational failures have their origin in "the liberal doctrine that school children have rights to freedom and individuality, and that subject matter should correspond to the changing capacities of the pupil" (103). I disagree with Barzun in the sense that self-direction in education need not

be seen as liberal tripe, and in fact eLearning platforms demand the exact kind of de-centered authority that he decries. On a deeper level, however, Barzun identifies a major fault in the American educational system. The fear of inequity, and of the ‘failure’ category that accompanies any true measurement of student achievement motivates America’s public school system perhaps even more directly than in Barzun’s day. In educational games I have worked on, we have been repeatedly admonished that “you can never tell the child that they failed! Encourage them to do better next time.” At the same time, the conflicting demand for accountability and quantifiable achievement driven by NCLB has created a rising culture war in education. Electronic educational technologies, with their dual sets of creative/academic goals, are caught somewhere in the uncertain and often ineffectual middle.

With a strangely prescient choice of terms, Barzun states that “The web of intellectual activities in modern civilization has its center in the enterprise of learning” (223). If we take the web he speaks of to be the very real (yet unreal) World Wide Web, learning is to be found at the very center of that pattern. Even in the grand scheme this definition rings true. It may not seem like a person entrenched in a role-playing game operates around a center of learning, but just as the potential meaning of the word ‘web’ has changed since Barzun’s writing, our definition of ‘learning’ must also have evolved. The great equalizing factor of the web—at least at a certain socioeconomic level—changes the definition from that of a learning institution, stable and concrete, to a set of internetworked learning processes. Instead of learning to do concrete tasks, the role-playing gamer is learning how to best behave in a given virtual subculture. In a less frivolous sense, online learners are internalizing a basic familiarity with the fragmentary modes of operation in the modern corporate world. It arguably benefits a college student more practically to understand how to multitask and problem-solve in an unstable environment (‘help,

a starship is attacking!’) than it does to score highly on classroom-administered standardized tests. In my post-graduate years in the corporate world, I have never once been offered a standardized test. However, I cannot even begin to count the number of times I have been expected to communicate with physically absent, often foreign members of the company in situations that required both a wary political sensibility and the ability to immediately produce solutions under pressure.

On the surface, it would seem logical to assume that secondary and postsecondary institutions of learning have followed the same patterns in this social and economic shift, but the opposite is often the case. In recent years we have seen the rise of an almost dictatorial approach to standards-based testing at K-12. As Barzun writes, “The countries of the free world that are struggling with the difficulties of mass education and of a superior technical and intellectual education may find that they cannot support both a faculty and an ived tower” (221). The faculty approach, drill-and-kill, wins out, but at the cost of the innovation and forward thinking that breeds true genius. The most difficult task in this kind of environment is to pull back from the pressing, immediate systemic breakdown and propose a plan that is not only visionary but practical. Referring back to his ‘web of intellectual activities,’ Barzun suggests that what is needed is “a generalized notion of how we think, how we speak and write, how we go to work, when our purpose is to impart or discover knowledge” (223-24). I would take this statement one step further and propose that, in a broken system such as the one we face today, what is needed is a close examination of how we actually *do* think, speak, write, and work, followed by a proposition of how we *should*.

That said, one of my greatest fears in my research is that I will develop a theory that is visionary, yet impractical. Barzun writes, “‘Significance’ itself requires apt and not pedantic

interpretation” (227). It seems evident that significant change requires applicable solutions rather than pure theory. It is for this reason that I move to part 4 of my theory chapter. This section incorporates angles of theory that can be quite alien to the literary realm—it addresses the practical concrete concerns of interface design, corporate and simulation training paradigms, among others. This divergence represents the heart of the crisis academia faces in the era of eLearning. It is reasonable to assume that the development of grand-scale immersive learning programs will be driven in part by backing from a corporate entity. In the past, education was traditionally acknowledged as the domain of strictly academic pedagogy (illusory as that may have been), but the democratizing force of Internet information systems has splintered that domain into myriad corporate, academic, and personal components. Far from the ivory tower ideal, knowledge in the 21st century is irrevocably fused with the needs and wants of a capitalist society. From the perspective of corporate higher learning, “knowledge becomes just another attribute of the changing economic reality in corporate America” (Baets and Van Der Linden 7). Increasingly, corporations design and own the programs and the technology products that we use in academic institutions. Any holistic theory of eLearning must therefore incorporate and address elements of MIS theory and its concomitant drives.

“Hard” Theory: MIS, Corporate Theory, and Interface Design

If theory is to remain relevant in the Information Age, we must fuse academic and corporate matrices to develop an applied theory of holistic primary-to-post-secondary eLearning. Cross-curricular collaboration is a necessary component of almost any digital learning initiative, but what we currently face is closer to a cross-sphere collaboration—in addition to the

interweaving of academic and corporate influences, Western students are heavily influenced by the unique culture of entertainment-based free time—what Gregory Ulmer terms the popcycle. Whether eLearning develops in the academy or in the business sector, the most salient challenge we face is that of seduction. In an era of multimillion dollar entertainment industries, in which pre-school age children play *Doom* and watch CGI dinosaurs on the big screen, how is media-based learning to compete?

My use of the term ‘compete’ is not arbitrary. Like it or not, modern eLearning is a commoditized product that is bought, sold, and paid for in even the most rarified academic setting. Corporate training and technology-based learning programs are concerned above all with content and performative results, but to focus solely on content overlooks the bigger picture. As McLuhan writes, “those who are concerned with the program ‘content’ of media and not with the medium proper, appear to be in the position of physicians who ignore the ‘syndrome of just being sick’” (*Understanding Media* 64). Placing training content mechanisms on the Web does not result in a successful eLearning system, nor does it necessarily result in learner motivation. To fully realize the motivational potential of eLearning, future programs will need to be more closely related to *Doom* than to framework systems such as Web CT. My use of the term ‘framework’ here is meant to characterize a non-immersive interface used mainly for data-transmission and classroom management, in a manner very similar to that of traditional classroom interaction.

In mass-market industry, eLearning platform developers often place the greatest weight on concrete design principles. This focus is not necessarily at odds with ‘soft’ theory, however. Management information systems designers commonly recognize the need for nonlinear training models and acknowledge that past paradigms have become obsolete:

Human beings behave and think in a nonlinear and dynamic way. Each individual, even from the same region and benefiting [from] the same pre-education, thinks differently from his or her colleagues. Therefore, one cannot hope that a particular course could fit all students. Further, it is extremely difficult to identify the ‘initial condition’ of each student. This sensitivity to initial conditions is another reason for investigating new educational paradigms. The old paradigm does not fit the modern world. (Baets and Van Der Linden 13)

There are two possible solutions to this problem. The first is to develop individually tailored subsets of learning programs to facilitate individual growth and knowledge. This approach, while appealing, is cost-prohibitive and would pose insurmountable problems for instructional design. The second solution involves learner self-direction in a nonlinear narrative format—the concrete realization of rhizome theory. In one sense, the Internet offers the ultimate dynamic model for such a methodology.

As we theorize the content for these postsecondary educational games, elements of design must not be neglected. The interface structure of online educational games, with their hybrid videographic-gaming format, presents a vital platform for analysis. According to the rules of modality theory, media can be classified into “dimensions of visual, audio and haptic modalities; and dimensions that describe the properties of media, such as dynamic (continuous) or static, and analogue/discrete/linguistic representations” (Sutcliffe 376). The role of visual and aural stimuli is evident in the games I use as case studies, but it could also be argued that haptic interaction takes place through the student’s use of the computer keyboard, earphones, and other tactile objects. While this type of fusion is common in entertainment narrative such as video games, how successful can such a multimodal learning experience really be? Sutcliffe *et al.* also

point out the need to take into account the “cognitive limitations of human information processing such as the need to avoid conflicting messages on the same modality (i.e. audio, visual communication channel)” (376). Critics of educational gaming could easily argue that the deluge of sensory information in first-person player games distracts learners from the process of knowledge acquisition and retention. Certainly, these critics have a point: a student intent on breaking into a biodome is not focused on learning algebra. However, I would argue that the real-world applications for learning do not involve skill sets in isolation, and in fact are probably closer to the world of the game than to the isolated academic world of the traditional classroom. Furthermore, performative learning has been proven to promote comprehension in Internet environments and in “multimedia applications which were designed to provide users with appropriate knowledge, interactive simulations and quizzes outperformed multimedia designs with animations but no interaction” (Sutcliffe *et al.* 377). Animation alone is not enough—it is the interaction that is the key.

Despite the positive attention that interactive multimedia environments such as *Quest Atlantis* and *Dimension U* have received from the press, these types of educational games are still open to criticism from serious scholars. Entertainment-based gaming is not strictly applicable to learning, and as Sutcliffe *et al.* state, “task and user characteristics influence media choice; for instance, verbal media are more appropriate to language-based and logical reasoning tasks; visual media are suitable for spatial tasks involving moving, positioning and orienting objects” (378). How then does one make a case for the use of visual media to teach language-based and logical reasoning tasks such as mathematics, reading, and social studies? I would argue that a well-constructed visual media setting, one that involves both narrative and a competitive gaming platform, serves as a motivating framework for academic learning. The spatial tasks within the

game are the context for the verbal learning elements. An excellent example of this relationship occurs in the game *Dimenxian*, in which the players must run down a grid to the correct X and Y axis points before they can gain access to a biodome. The X and Y axis points are taught through a hybrid audio/textual series of commands that teach the student-player the fundamentals of algebraic equations. However, the students' motivation to solve the problems is still the visual and narrative context of the game—solving the problems advances them in the storyline. Again, critics might argue that learning becomes an incidental side-effect of entertainment, but there is a strong case for the role of intrinsic motivation in cognitive retention.

Motivation becomes a tricky subject in cyberspace. As we build online frameworks, it is important to remember that the general realm of the Internet can be an unstable and alienating forum for learning. Although theorists such as Ulmer have created structured frameworks in which students construct their own mosaic-style Internet sites, this kind of isolated process will not serve as a permanent solution. Gerry Kramer, founder and chief executive of the Globecon Group, argues that “you can only carry self-education so far. The reality is that people need interaction with other people. Our course participants do not like to sit in front of the computer for learning, however engaging and clever the technology” (qtd in Sloman 187). Kramer speaks from the perspective of a corporate training company, but his point is equally applicable to an academic environment. To be successful, an eLearning program must emphasize connectivity in its establishment of an interactive community. Increasingly, however, a flaw is developing in Kramer's logic: the strictly defined concept of interaction as physical presence is beginning to morph. Although modern mores define the workshop as a presence-based entity, as succeeding generations of students enter the university system they are increasingly comfortable in the digital New World Order.

I once again want to emphasize the importance of management information systems in the construction of applied eLearning theory. John O'Donoghue of the University of Wolverhampton writes at some length about the risks eLearning poses for academic institutions:

Those institutions that will not or cannot change their structure to incorporate this [eLearning] technology may be bypassed by other educational providers, such as virtual universities and independent educational services. It might well be the case that corporate universities which hitherto only offered training to its employees will be in competition with the higher education sector. (qtd in Lorenzetti 4)

I have no doubt that Wolverhampton's premise is valid even today—in fact, universities such as UCF are now not far removed from becoming corporations themselves. The organizing principle of UCF's drive for higher enrollment is based on a desire for increased status and funding, all of which can result in a sales-based approach to higher education.

Marketing needs and academic visions are not mutually exclusive. As Gee posits, gaming builds learning foundations in its own right. Furthermore, it is often more successful at this process than traditional academic environments. In an entertainment-based culture, players of all ages 'learn' from video games far more readily than most theorists will admit:

This is what is magical about learning in good video games—and in good classrooms, too—learners are not overtly aware of the fact that they are 'learning,' how much they are learning, or how difficult it is. Learners are embedded in a domain (a semiotic domain like a branch of science or a good video game) where, even when they are learning (and since the domain gets progressively harder, they are always learning), they are still in the domain, still a member of the team (affinity group), still actually playing the game, even if only as a 'newbie.' (Gee *Video Games* 123)

It is unlikely that eLearning platforms could create such affinity groups unless they have a cohesive and engaging structure. Clearly, immersive gaming programs such as *Quest Atlantis* are far more appealing to learners than Web CT, and the video-game format of the former is no less appropriate a medium for educational content. It is a known fallacy that a class must be deathly dull to be ‘serious,’ and to embrace the potential of eLearning we must also accept the fusion of entertainment and education discourses.

Although I am using corporate and primary models as case studies, I must acknowledge that postsecondary educational games will differ both in scope and purpose. There is a distinct difference between an educational game which attempts to teach a skill set—*Dimension U’s* practiced repetition of multiple choice questions—and one which attempts to teach higher-order thought processes. How, after all, might one conceptualize an online game for a literary theory course? If students can discuss concepts and arguments with Derrida’s avatar, how does that change their lived experience with the text? If they must rescue Derrida from a pirate ship, does it demean the learning process, or does it actualize poststructuralist views through its sense of play with the binary divisions between education and entertainment? While I am not seriously advocating a Derridean pirate adventure for students of literary criticism, I do take seriously the element of entertainment. At what point does a narrative device enhance the learning process, particularly in a K-12 institution? In his discussion of games in 20th century society, McLuhan points out that civilized man [sic] does not seek out “the depth [of] participation that erases the boundaries of individual awareness, as in the Indian cult of *darshan*, the mystic experience of the physical presence of vast numbers of people” (*Understanding Media* 238). While simulation environments of course do not offer physical presence, there is no reason they cannot erase boundaries rather than enforcing them. The seemingly stringent boundaries of a print text are in

fact a constantly changing web of ideas formed by the multiplicity of author/reader interfaces. If every reader changes a text in the reading of it, how far then is the step to allowing the reader to literally manipulate and shift the text in an online environment? For that matter, there is also the exciting possibility of translating text into form and motion in simulation environments—future technologies could enable learners to build audio-visual matrices from the textual ‘construction pail.’

Translating textual education into Internet learning modules means that elements of instructional design become vital to the program’s success. In his iconic video lecture, “Doing With Images Makes Symbols,” Alan Kay states that educators

first have to develop a curriculum based on ideas, not on media. Media can be amplifiers of those ideas, but you have to have the ideas first. And I think the reason computers have failed is that almost everybody, no matter which way they try and use computers, has wanted the computer to be some kind of magic ointment over the suppurating wound of bad concepts. (1:29:49)

Although Kay’s lecture was taped in 1987, he describes the current state of computer-based educational tools with precision. Computers are far more advanced than they were in 1987, and far more prevalent in both schools and homes, but there are as of yet few truly native applications for digital learning. It is common to see print media translated awkwardly onto a desktop screen—as in PDF eBooks—but few educational apps treat the web with an eye to ideological curricula. Interestingly, the world of commercial video games is perhaps the best example of a web application designed for a digital environment. While it is easy to dismiss gaming as a for-profit industry, and therefore more privileged than the field of education, most people do not realize how large a corporate industry educational publishing has become.

According to the 2010 Executive Report of the President's Council of Advisors on Science and Technology (PCAST), the 2010 national spending figures on core K-12 education United States are estimated at approximately \$583 billion (PCAST 5). What then is the mental block that prohibits publishers from investing millions in digital platforms? The answer may be more sociological than economic. Attitudes towards digital learning programs in schools are still often skeptical and sometimes overtly hostile. Moreover, teachers have a right to feel this way. Issues of computer access, students in low socioeconomic groups who are not computer literate, and school technology access can all make teaching with technology a dubious proposition.

This gap is closing fast, however. New hardware such as the XO-1 laptop, touch-screen mobile phones, and iPods are making digital environments increasingly accessible. Access aside, market resistance is also fading as the media itself becomes more widely accepted. In 2009, the hugely-powerful Texas State Board of Education voted that "school districts for the first time can spend a portion of state "book" money on computer hardware and digital content. And the state can stockpile and open-source electronic material, made available [for] free" (Thevenot para. 1). Entirely virtual schools are being launched in states across the nation at levels ranging from kindergarten through graduate school. It is evident that in the next 25 years, digital learning platforms will experience a revolution in both funding and access. The key questions, then, are who will develop the new learning interfaces, and why.

In my experience, school publishers have so far tended to approach eLearning applications the wrong way. This failure is not through any ill intent, but rather through the failure to grasp the inherent difference in the medium. We are like Renaissance-era scribes who keep trying to make Gutenberg's printing press reproduce our hand-scripted illuminations. The key to the revolution lies in understanding the way in which, rather than a way to reproduce mass

quantities of an already-existing product, the new medium requires a fundamental recalibration of how information is transmitted. Movable type is to publishing what nonlinear digital delivery is to eLearning. Instructional design thereby becomes a role dealing not only with design and usability, but also with cognitive psychology.

Furthermore, instructional designers in the new digital world order must often consciously attempt to approach problems of design and structure as outsiders. As Alan Kay notes, “I suddenly remembered McLuhan: ‘I don’t know who it was who discovered water, but it wasn’t a fish.’ Because it is in part the duty of consciousness to represent ourselves to ourselves as simply as possible, we should sorely distrust our commonsense self view” (“User Interface” 195). In this view, the designer most comfortable with the digital medium may not be the one best suited to invent new cognitive models for learning. The metaphorical fish takes for granted the normative existence of water, while the scientists living outside it are the ones who investigate its properties and uses. The digital medium challenges such basic assumptions as Piaget’s and Bruner’s processes of learning. In Bruner’s model, “learning takes place best environmentally and roughly in stage order—it is best to learn something kinesthetically, then iconically, and finally the intuitive knowledge will be in place that will allow the more powerful but less vivid symbolic processes to work at their strongest” (Kay, “User Interface” 195). At first glance, this kind of model seems straightforward—learners move from kinesthetic to iconic (visual) to symbolic cognition. But when the model is translated into digital media, it blurs measurably. Does a mathematical manipulative block set translated into a computer program become a symbol of the kinesthetic (physical) block? Is an icon-based navigation-system going to impair purely symbolic cognition? And at an even more basic level, is an icon on a computer

ever an icon at all, or does it start off as a symbol, framing a metaphoric cover for the functional code beneath it?

Instructional design is further troubled by the question of platform. If the medium is the message, it is necessary to take into account the technical medium in a very literal sense. In what kind of framework is the Platonic ideal of eLearning developed? Is it in html? CSS? a memory-intensive graphic interface? And is it delivered on a mobile device, or on a desktop computer? In some ways, the objective of good instructional design is to make the technical interface transparent. In contrast, digital educational products often seek to leverage technical aspects (visual, aural) by manipulating the technical interface. These impulses are less at odds than one might initially think. Component Display Theory classifies four “primary instructional strategy forms: presentation (tell), demonstration (show), recall (ask), apply (do)” (Merrill 13-14). These four steps dimensions are far from linear, and in fact can be complimentary when leveraged correctly. Content can be presented through demonstration, and application in its turn can be used to solidify recall of content. In this way, developers can protect their imaginings of task-centered eLearning from the fallacy of contrived situational outcomes, in which the learner must solve a task in a particular and prescribed manner. As Merrill points out, “Real-world tasks are not contrived. They often do not have a single correct answer. They can often be solved in several ways and the resulting artifact or activity can take several forms” (8). This kind of non-linear instructional design approach is already built into the fabrics of mass-market MMOs. Adjusting our ID perspective to the perspective of real-world tasks is an important step in leveraging a successful digital model.

Access and the International Sphere: Political and Social Contexts

The preceding theories do not fully take into account the fundamental paradigm shift caused by the now literally world-wide web. While there is no one theoretical perspective that can adequately address the pitfalls and opportunities inherent in 21st-century networked education, theories surrounding globalization and the politics of access do much to illuminate the issues. Publications that describe the impact of this ‘flattening’ have proliferated since the mid-2000s—including the works of Thomas Friedman, Robyn Meredith, and Dan Steinbock—but there is as of yet no clear idea how this process will transform education. Access has replaced geographical location as the gatekeeper of knowledge in the Information Age, and the digital divide, far from being a binary line—Prensky’s digital natives and digital immigrants—has become instead a series of fluid grayscales. There are multifaceted socioeconomic drivers to consider—on which side of the digital immigrant/native divide should we place a 12-year-old living in the slums of Detroit, who may be commonly exposed to cell phones, television, and a Playstation, but who does not have a home computer?

Another facet of technologically-enabled globalization—and one which has important consequences for the future workforce—is the rise of manufacturing centers in China and knowledge workers in India. This shift to a mobile virtual supply chain has certainly put increasing economic pressure on the American workforce. A recent profile by journalist Robyn Meredith of an Indian worker at Infosys describes “Vishwas Jain, twenty-eight, an electrical engineer with an MBA who earns \$14,000 a year [and who] helped Sony build a business-to-business website” (119). There are two powerful forces at work in this equation. The first is the stark economic reality of the disparity between accepted stateside and overseas wages for a

highly educated worker who is building online infrastructures for international companies. \$14,000 a year in the United States is hardly a tenable salary for a high school dropout, yet no matter how much white-collar workers may protest, a capitalist economy tends to reward the lowest bidder. All things being equal, the job will go to Infosys. The second, and perhaps more pervasive force, is the way that telecommuting has transformed the everyday communications requirements of the workforce. The successful engineer is no longer bent over a draft table, but is instead at home swimming, not surfing, through the virtual world—Infosys’s clientele include Apple, Reebok, and the Gap, literally half a world away from Bangalore—and thereby embraces the abstract model of Internet products. American workers are finding it hard to adjust to both aspects of the new world order. Stephen Roach, a chief economist at Morgan Stanley, claimed in 2007 that “we’ve got to reinvent ourselves again [...] the middle-aged, highly skilled white-collar workers are realizing, ‘my job is gone and I’m not going to get it back.’ The rise of India and China is transforming the global economy, and neither America nor Americans are ready” (qtd in Meredith 191).

So what does this crisis have to do with education, and more specifically with eLearning? The first level of paradigmatic change occurs in the realm of possibility. It is both possible and practical for American educational publishers, educational nonprofits like the OLPC, and traditional academics to translate their ideas beyond the geographic limitations of their location. In fact, emerging international markets offer unprecedented opportunities for collaboration outside the traditional corporate sphere. As Steinbock puts it, companies think strategically “about philanthropy by using charitable efforts to improve their competitive context, particularly the quality of the business environment in the locations where they operate” (79). While this may sound like a questionable ethical framework, I would argue that the means justify the ends in this

context. No matter what the motivation for charitable efforts, multinational educational nonprofit initiatives will still have tremendous potential to create lasting change. The stakes are simultaneously higher and lower in impoverished international markets. One OLPC study of XO deployment in Samoan classrooms noted that in one of the schools “the classrooms were almost bare walled with few posters, holes in the blackboards, and there was no library of books for the students to read. A Laumoli teacher showed us the 2 books she used for her class for the year” (Roder and Parker 4). In these kinds of conditions, technology deployment may indeed bring transformative change.

The second implication of the flattening trend in educational and commercial markets is the roll-down affect on American educational markets. Salvatore Babones of the University of Sidney admits there are still critics of globalization, but he sums up its effect on education by saying, that “nonetheless, the general public policy discourse is one of the premium placed on knowledge by globalization. The promise (or threat) of globalization is used to promote education, not to retard it” (46). The U.S. government’s response to the threat of globalization, as illustrated by the *NETP* alone, certainly bears out this claim. The American educational system is first and foremost responsible for preparing students to function as active and engaged members of society. On the most practical level, students must be able to compete in the virtually-networked multinational workforce of the future. As a whole, the assumption seems to be that the future success of American public school students is quantifiable in two ways—their immediate success in future grades and in college, and their long-term success in the workforce—and both categories of success are increasingly contingent on a technologically-literate education.

I do not mean to imply that the goal of educators is to develop high-earners. The goal of a

national education system, however, is almost certainly to produce a citizenry that can support themselves and contribute to a successful and productive nation. It is for this reason that the status-attainment model in sociology, which posits a widely-accepted link between education and income, is applicable to the goals of public education. As Babones points out, sociologists have not, however, paid much attention to how the education–income relationship might be conditioned on important macro-level social forces like technological change, increasing education levels, or increasing trade globalization” (47). On a deeper level, the problem requires a ground-up analysis of the priorities and assumptions in American education. Meredith writes that the “most critical building block is education. Federal, state, and local governments—and the individuals who elect them—will be catastrophically irresponsible unless they insist on dramatically improved education, starting with elementary school” (205). If the ultimate goal is to train innovation into America's youth, we as educators must stop and examine traditional assumptions about public schooling. As the *NETP* acknowledges, we must also do it *now*. This alarmist attitude in American education is spawning an increasingly desperate search for a scapegoat. The 2010 documentary *Waiting for Superman* touts for-profit charter schools as the answer to a public education system in crisis. In a scathing review of the film, Diane Ravitch notes that its premise is:

At last we have the culprit on which we can pin our anger, our palpable sense that something is very wrong with our society, that we are on the wrong track, and that America is losing the race for global dominance. It is not globalization or deindustrialization or poverty or our coarse popular culture or predatory financial practices that bear responsibility: it's the public schools, their teachers, and their unions. (para. 6)

As Ravitch notes, however, this alternative to the public school system creates a fundamentally

disturbing trend. She notes that while many people react emotionally to the final scene, in which the children and their parents wait to hear the results of the charter school lottery, she was uncomfortable with the air of public humiliation, and “felt an immense sense of gratitude to the much-maligned American public education system, where no one has to win a lottery to gain admission” (para. 34). Although the battle to transform American education may be vital to our future as a nation, the concept of equal access to education, as imperfectly executed as it may be, must not become a casualty.

What is the answer to this problem, then? On a very basic level, it cannot be to drill more thoroughly through standardized tests, but it instead must be linked to a re-envisioning of the core modes and methods of education itself. Unlike the pedagogical aims of the No Child Left Behind era, which do seek to test knowledge primarily through regurgitation on standardized tests, this kind of approach to application mandates that acquiring skills “in the context of whole tasks makes it more likely that learners will form mental models about how this information applies in the real world” (Merrill 15). The world around us has undeniably changed over the past 40 years, morphing into a multimedia-rich sphere in which information is and should be both acquired and communicated through multimedia—yet, as Ken Robinson has pointed out, our system of education system retains much of the same practices as it did in the early days of the Industrial Revolution. This kind of system makes transfer almost impossible.

It makes sense to assume that innovation in lifelong education is the first step towards innovation in the future workplace. Interestingly, the "Council on Competitiveness suggests the United States embark on a national campaign to create 'regional innovation hot spots' in the same way China built industrial parks to attract a concentration of new factories" (Meredith 209). When a virtual lab allows students in all areas access to elementary science experiments, and an

inner city child can observe the organisms in virtual pond water, it encourages the seeds of innovation both in its users and in its creators. It is ironic to think that while innovative solutions to educational problems could help solve the innovation crisis in the American workforce, the No Child Left Behind mandates are putting our educational system on the exact opposite course. Just as Alan Kay turned to the programs of Shinichi Suzuki and other early childhood learning models, we must also start to see education and innovation within eLearning as a holistic process. In other words, we cannot separate out one piece of the educational process from the rest and expect to see a revolution.

Of course, the solution is hardly as simple as saying ‘this is what we should do.’ A huge range of economic, social, and conceptual problems trouble the mass rollout of any kind of comprehensive K-12 eLearning initiative. One of the most concrete of these problems is the socioeconomic and ethnic divide in Internet access in America, a gap that prohibits American public schools from adopting full-on digital learning solutions. Moreover, this access gap is often predicated by part on ethnicity. In 1998, Hoffman and Novak were already predicting the role of race in Internet access, noting that “regardless of educational level, whites were significantly more likely to own a home computer than were African Americans and to have used the Web recently” (390). Almost a decade later, this ethnic gap still holds true and the work of Hoffman and Novak has come to seem almost prescient. Of the race gap alone in digital access, they predicted that “the consequences to U.S. society of a persistent racial divide on the Internet may be severe. If a significant segment of our society is denied equal access to the Internet, U.S. firms will lack the technological skills needed to remain competitive” (Hoffman and Novak 391). Chapman, Masters and Pedulla took up the same issue in 2010 with a survey of teacher access in Title I schools, and their results indicated “that despite efforts in recent years to increase

technology in HN schools, and calls for the end of the ‘war on the digital divide’, the level of access, or at the very least *perceived* access, to technology still remains unequal” (246). The recent series of political and economic events have begun to reveal some of the effects of the United States’ refusal to commit to 100% technology access in education. If one child out of a class of 25 does not have a home computer, the teacher is still rightly reluctant to assign online homework or digital projects. The cruel truth is that education is one of the only industries in which the lowest common denominator rules business decisions. I would like to propose a somewhat radical solution. Instead of waiting for the technology to saturate the market, we must reverse the paradigm. The solution is not to wait for equal access for all, but rather to develop models of education that force innovation through technology.

The traditional four-discipline, standards-based approach to learning in the era of No Child Left Behind saturates our learning institutions from the ground up, at the same time failing to take into account the realities of living and working within a networked world. Yes, reading and writing are and always will be important, but what of the ways we choose to teach those skills? I have no simple solution to this problem, nor does anyone on either side of the divide. As I enter the process of close analysis in my case studies, I leave these as open questions in the understanding that an easy answer is rarely an answer at all. Instead, I close my theory chapter with the oddly hopeful words of Alan Kay, the nearly legendary forefather of modern interface design, “Well, there are so many more new issues that must be explored as well. I say thank goodness for that. How do we navigate in once-again uncharted waters? [...]‘The best way to predict the future is to invent it!’ (“User Interface” 206). Without further ado, then, I move on to those uncharted waters.

CHAPTER 2: GENEALOGIES OF PRACTICE

“Oh yippee. Can hardly wait....” –Anonymous

As the previous chapter has probably made clear, there is by now an abundance of theory about the different branches of eLearning. From corporate MIS to simulation training, cognitive development to first-person gaming, it seems that everyone has a theory about how and where to implement eLearning initiatives. The practical applications of these theories, however, are still few and far between. This is an odd conundrum. While there is a clear groundswell of enthusiasm in the market, there are as yet few examples of successful transference between theory and practice. One root example of this problem can be seen in the responses of individual teachers to news about educational technology “innovations.” In September of 2010, *Education Week* published an online article about Houghton Mifflin Harcourt’s new \$100 million innovation fund, enthusiastically noting that it was “to be directed toward projects that spur student achievement, individualized instruction, and technology integration [...] as the company continues trying to fuse existing content with new media” (Quillen “Unveils” para.1-2). The first reader comment on the story reads:

Oh yippee. Can hardly wait. After spending 2 1/2 years with math curriculum from another publisher and the constant corrections, new replacement cd's [sic] and curriculum, plus inequity in site equipment, this will be a blast to watch. I'm not opposed to technology, just the hundreds of thousands of dollars I've seen wasted in school districts with no plan to use it effectively. (Quillen “Unveils”)

The following comments support the first anonymous poster’s skepticism—while there is no question that teachers are interested in technology, there remain serious and pervasive doubts about its implementation. This skepticism seems to build when corporations get involved.

Why is this the case, when there is such a rich and diverse set of theories about digital learning? The answer lies partly in the fact that very little of the theory can boast a practical application. The combined forces of high development costs and rapidly-shifting technology innovations make it nearly impossible to “free-play” with applied theories of eLearning. And the big educational publishers are gun-shy. As the Director of the American Textbook Council argues, the main goal of the Big Four [which includes Scholastic] is not to innovate, but to “use their collective might to try to keep an iron grip on state and big-district textbooks budgets” (Sewall 44). This deathgrip does not easily lend itself to investigative R&D. In fact, Sewall warns that in coming years the situation will get even more dire, and we should expect these Big Four publishers “to repackage and redo what exists in their computer banks, including abundant online and CD-based supplements. They may try to sell what they once gave away as freebies. And do not expect any ‘innovation’ in the electronic K-12 materials they offer” (44) The problem here is fairly simple, yet seemingly impossible to solve. To create an immersive online learning environment with any chance of widespread success, a theorist would need an army of developers, instructional designers, and coders. Paying for the implementation of such a plan (up to and including server hosting costs, the creation of secure sign-in, a sales force, and professional development training), is not possible without corporate backing. For the most part, the big corporations are cagey, suspicious, and extremely unwilling to take that chance.

To better understand the roots of this issue, it is necessary to first take a step backward from all the confusion. Before educational technology became such a pervasive and thorny

problem for publishers, before immersive online environments were the norm, before Facebook, Foursquare, and Twitter connected people across virtual spaces...where did the process of translating eLearning theory into practice begin? Understanding the genealogy of practical theory is one of the keys to unraveling the current problem, and one of the best and earliest examples of theory put into practice is that of Gregory Ulmer.

It seems strange to posit Ulmer as an “early example” in a genealogy. After all, *Internet Invention* was published in 2003, less than eight years ago. In Information Age years, however, that might as well be the Dark Ages. At its highest level, *Internet Invention* is meant to serve as a kind of rhetorical manual for online composition, a re-envisioning of how to teach and produce texts in the Information Age. In so doing, Ulmer coins the term electracy, which he says “is to digital media what literacy is to print” (*Internet Invention* xii). This is a central issue in the whole debate on digital learning—if Ulmer really has developed an applied framework for electracy, its principles in theory should be extendable to other grades and disciplines. There is no one-size-fits-all digital solution, of course, just as there is no one classroom pedagogy, but there are enough touchpoint-commonalities in digital theory to argue for a common application as well. Could Ulmer have solved the “effective plan” problem? The first step in the investigative process is to understand—at a high level—what his theory proposes. The second, and more exciting step, is to examine the living online examples of student texts which his theory has produced.

Ulmer’s theory of Internet invention is one of the few that has practical and relatively large-scale examples of student work available. While some of the other theorists I study, like James Gee, have contributed to the learning principles of existing platforms, there are few quantifiable student projects available. In contrast, Ulmer spent several years putting his theory

into practice in classes at the University of Florida. Rather than the traditional written composition assignment, Ulmer asked students to compose fragmentary websites using images of wide scope that have personal meaning to them. Clearly, there is potential in Ulmer's vision of the linked communicative framework. In *Internet Invention*, Ulmer starts by positing the existence of the teacher as guide for the EmerAgency, a fictional consulting group created "as a framework to motivate the website projects" created by students (1). Creating a context for motivation addresses one of the fundamental questions of how to teach students to compose for the web—what exactly is it that makes online composition something relevant, and more than just a trendy gimmick? This context of relevancy is important largely in terms of positive transfer. From the perspective of cognitive psychology, negative transfer in simulation occurs when "the trainee reacts to the transfer stimulus correctly as he or she has practiced and trained, but incorrectly in relation to the real world" (Hancock *et al.* 50). Because Ulmer's theoretical approach is quite firmly rooted in a real-world context, it should help students frame their EmerAgency compositions in a useful context related to tasks they could be asked to do in school or in careers.

First, there is the question of delivery platform. It is possible, of course, for a college student to upload a traditional research paper to an LMS, just as it is possible to take an elementary Social Studies textbook and translate its pages within an HTML frame, adding small animations and resource links to make it an 'interactive' edition. Yet Ulmer's creation of the EmerAgency is far from frivolous. His theoretical groundwork identifies something missing in this process—something forced and untrue about the translation of print media conventions onto the Internet. This perspective is not shared by all of the players in the educational publishing market. As part of California's Digital Textbook Initiative, Governor Schwarzenegger positioned

digital textbooks very specifically as the future of California’s public school system. In a 2009 speech at Calabasas High School, he told an assembled group of students and teachers that

the bottom line is, I feel how can kids compete in the global economy when the information the schools feed them is stale and is outdated and is old? So digital textbooks will change, of course, all of that; they can be frequently updated to better prepare our student. And there will also be more opportunities for interactive learning and you know how exciting interactive action is. Students could read about a science experiment and then click onto a video and then see immediately a kind of demonstration of this science project. (“California Office of the Governor”)

Governor Schwarzenegger pinpoints a key problem in the American public school system—textbooks do not teach children to think or speak in the agile languages of the digital global economy. From Ulmer’s perspective, however, Schwarzenegger’s solution is equally flawed. Digital textbooks, no matter how interactive, are hardly even Level I of my online hierarchy. The concept of an eBook is by its nature an odd entity, positioned as half-translation between two media.

In contrast, one of Ulmer’s greatest strengths is his willingness to re-imagine online composition as *connection*. In the introduction to *Internet Invention*, Ulmer posits that the biggest distinction between print and online writing is “the fact that someone besides the teacher may read what students write.... The internet brings into potential communication all the institutions of society” (1). While this is literally true for his college students, most of whom are building publicly-accessible websites, it is a point applicable to any educational framework. Even in a password-protected LMS for a kindergarten class, online student compositions are potentially accessible in ways that physical projects are not. Online discourse opens up the

possibility for collaboration across classes, countries, and disciplines, and as such it has untapped possibilities for change. Imagine, for a moment, California STEM students in the United States collaborating with Chennai to construct an online narrative. What might those students learn about culture, collaboration, and difference? Even beyond those “soft” skills of the humanities, what might they all learn about how to successfully manage and run industry projects outsourced across international borders?

Ulmer’s focus is on exactly this kind of borderless narrative. In trying to invent electracry, he is trying to solve the problem of “how the new technologies might affect our working conditions and teaching practices” (Ulmer *Internet Invention* 5). This kind of conscious re-envisioning necessarily has to address a whole range of “affects,” including the issue of positive transfer. For this reason, it is slightly surprising that the practical application he chooses is mystory. As Ulmer himself notes in *Internet Invention*, mystory “is the name for a pedagogical genre I introduced in *Teletheory: Grammatology in the Age of Video*, (Routledge, 1989)” (5). This choice is surprising for two reasons. First, it attempts to re-envision a format developed for video, more than thirteen years before the writing of *Internet Invention*. It was not until the 1990s that Internet use became more mainstream, and in Information Age time, the discursive gulf between 1989 and 2003 is nearly unbridgeable. In terms of print writing styles, mystory is also closest in form to memoir, perhaps the most self-reflective and inward-looking of the genres. To be fair, Ulmer explains his logic, making a connection between rhetorical composition practices of discourse “a promising correspondence of features (isotopy, homology) aligning associative ‘lateral’ reasoning described in studies of creative thinking, and the ‘dreamwork’ of entertainment culture” (*Internet Invention* 6). Entertainment discourse in today’s online games and social networking sites is widely acknowledged to be self-obsessed and inward-looking,

focused most closely upon the individual. In this context, Ulmer's theory makes a valid point—the natural starting point in entertainment narrative is always the viewer/ player.

Ulmer's focus on image is the next main cornerstone of his theory. The stated purpose of the mystory, and indeed for *Internet Invention* itself, is to test his assumptions about discourse and electracy “by organizing a course about the internet and World Wide Web as a workshop devoted to the composition (invention/ discovery) of the students' images of wide scope” (Ulmer 6). This concept of wide scope is focused less on a single image than on a pattern traced through groups of images. As Ulmer explains it, “every person possesses a wide or guiding image (actually an interrelated set of four or five primary images) if only in a potential state, as a disposition or propensity” (*Internet Invention* 18). Again, this is a slightly odd manifesto in the age of a million images, where students may choose a different photo a day to represent themselves on Facebook, five different avatars for every game they play, and a new image of an entertainment idol every week. In 2010, and even back in 2003, when Ulmer was writing, the profusion of images on the Internet was one of its most salient aspects. The image of wide scope is perhaps an effort to harness and contain that nearly limitless procession of images in the rhizomatic web. The concept of a central image (or image series) is limiting, but at the same time sanity-inducing. All composition, traditional or electrate, must have a focal point.

To give Ulmer credit, both the image of wide scope and the mystory encompass numerous complex and meaningful subgenres. For example, Ulmer focuses in particularly closely on the media-rich genre of advertising. He writes:

As a relay for mystory, the ad starts in the right direction, in that it promises the possibility of becoming ‘artists of ourselves’ (Williamson, 1978: 70). [...] Advertising and art work at opposite poles of meaning creation, however: advertising persuades

individuals to adapt a ready-made norm, while art persuades a collective to accept a private or personal theme as having collective or universal relevance. (Ulmer, *Internet Invention*, 257)

The problem that Ulmer grasps at here is the intensely difficult process of translating traditionally academic discourse into an image-based and non-linear academic world. By identifying advertising as the trope for the mystery, he also obliquely acknowledges the influence of corporate branding on the Internet. Ulmer's second and almost contradictory point, however—that advertising runs contrary to the personally and didactically meaningful—speaks to the most frustrating problem faced by new eLearning applications. While the Internet is made up of both private and corporate voices, many of the loudest of those voices for modern American students (video games, Facebook, prime-time television) revolve around the nexus of advertising. Advertising is far more rooted in the visceral—the immediacy of human acquisitiveness—than in the traditional logical order of the academy. It is this shift which Ulmer highlights when he says that “One of the difficulties in moving from literacy to electracy in the register of Career or disciplinary knowledge is this shift in state of mind from skepticism (the default mode of science) to yearning (the default mode of imaging)” (*Internet Invention*, 268). I think it could be fair to characterize today's educational market as both profoundly skeptical and yearning, a discipline caught in the middle of this kind of shift.

So what, however, if we re-envision students as consumer-producers in an online world saturated by a seductive blend of imagery? Does Ulmer's theory offer any practical lessons to take away? For eLearning developers, perhaps the most important lesson is how the default image of wide scope is changing—both in the sense Ulmer describes, and in the developments that have occurred since his book's publication. Instead of watching advertisements for realistic

food products, goods, and services, in the manner digital immigrants did on televisions, modern children are bombarded with tropes made up of the fantastic and wholly surreal. From video games which illustrate modern warfare with 3-D programming almost indistinguishable from reality, to previews for movies laden with spectacular CGI aliens, today's student consumers have been raised to see media as lifelike, spectacular, and—perhaps more importantly—a fantasy that is quite often alterable through their own agency. The image of the active consumer-producer is not unique to Ulmer's work. As early as 1996, Tapscott “introduced the term ‘prosumption’ to describe how the gap between producers and consumers is blurring” (Tapscott and Williams 125). Thirteen years later, most students in college are well-accustomed to acting as prosumers, if only in the prosaic sense of creating an online community through their avatars. Ulmer's attempt to make students into artists of themselves, through the entrée of advertising, is far less disconnected than it initially sounded.

Ulmer's instruction manual is not confined to the printed text of *Internet Invention*. He has created at least three websites of his own dedicated to the task of helping students compose mystories and images of wide scope. On his “How to make an emblem” webpage, for example, Ulmer included a template with a (text) motto, a blank placeholder for a picture, and the word “Epigraph” underneath. This representation dovetails nicely with the theoretical text, where he states that “the complete word emblem contains both a pictorial and an interpretive element” (Ulmer, *Internet Invention*, 250). Instead of simply choosing an image, the student must fuse image and text, interpolating the visual medium with the written. Ulmer's websites function as a kind of “tips and tricks” version of the mystory, condensing chapters worth of the print book into simple paragraphs and images. In this sense, the webpages themselves serve as a kind of missing

link, a halfway point on the evolutionary timeline between the (printed) theory text and the (online) student work.

While the theory of Ulmer's *Internet Invention* deserves much more careful study, this chapter has no space for a more thorough assessment. Instead, the focus must shift from the theory to the application. How does the mystory translate in the works of Ulmer's own classes, and do they bear out his assumptions about electracy and wide image? On the surface, the existing examples of mystory turn out to be quite user-friendly, and clear enough to be translatable (as in fact they are through Ulmer) by a theorist unused to electracy. How then have Ulmer's students put this theory into practice? While both *Internet Invention* and his websites lay out theory-rich guidelines for implementing mystory, neither of them truly show a model of implementation. Instead, I turn to the small student fragments posted on Ulmer's University of Florida website. There it is possible to see at least a basic implementation of mystory in the work of Stephanie Evans. Her mystory, composed of linked images and text, reads much like an imagistic mosaic memoir, using fragments to guide the reader through the piece in a wholly surreal and explorative manner. In this sense, Evans's work echoes Ulmer's prediction that mystory will be an "inversion of the literate hierarchy," and that "the first communication of an electrated person is reflexive, self-directed" (*Internet Invention*, 5). Her mystory looks inward at her personal history by exploring very private aspects of her own experience, mainly her struggles with bulimia.

In an interesting twist which speaks to the ephemeral nature of online work, Evans's mystory—which was hosted on the University of Florida website at the point that my research began—no longer existed in October of 2009. It had been wiped away in a manner far more difficult to do with a written text. A text may be burned, drowned, or thrown away, but it does

not simply “change” in the sense that a hosted website can. In this manner, the process of research on electrated mystery raises questions of archival storage. While Ulmer claims that “making a mystery tends to produce uncanny connections (*Internet Invention*, 99), the instability of the web is as likely to produce uncanny disconnections. For a period of several months, Evans’s mystery was little more than a ghost to me, existing only in the small fragments that I had cut and pasted over the course of my research. For example, I knew that Evans said of her *Brain Spasms* mystery:

One of the greatest realizations I had while completing this project was the tremendous role the medium plays. Had my previous projects taken place in the traditional classroom setting, I would be working with three different typed papers. Papers that would be confined to the pages they were printed on. Most likely, cutting up my old papers to create a new one would produce nothing significant. However, with the Internet, linking bits and pieces from my previous projects has the capability of bringing forth entirely new ideas. (“Introduction”)

I copied these words in late 2008, but for a time I had no proof and no reference for what Evans had said, beyond the text which I happened to have captured in passing. In a very real sense, her work existed for a time in a meta-sphere composed only of my memory and that of others. While the link to Evans’s mystery was later copied into Ulmer’s new site, its existence there is almost certain to have some kind of end date as well. Taking a screenshot now may serve as “proof” in the context of this dissertation, but it does not preserve the living nature of the mystery in any real way. The translation of the living mystery into a static “print” screenshot echoes one of the key issues in online educational discourses. How does one document and report on ephemeral objects composed of hypertext and code?

Just as an easily-identifiable difference between Evans's mystery and a traditional print composition project is the active and critical role of the image in her work, the question of image as schema is further complicated by the mutability of visuals online. *I have no screencap of Evans' whale shark and the pageant crown—does that make this part of her work less “real”?* As I have touched on many times before, Internet content itself is rarely static. For example, in the mystery that replaced Evans's on Ulmer's site, the link to “Gangs” on one page led only to a ‘page not found’ error message. It is quite possible that nobody can now remember what content this site ever held—even the creator of the mystery. Was it a site on ancient bonding rituals? Jung's confrontation with the unconscious? An image of Snoop Dogg? The meaning of the reference has come entirely unmoored. Moreover, any student project which incorporates hyperlinks will encounter this type of problem. While it is exciting and groundbreaking to think of extending the composition project by linking it to outside pages, this process raises some practical issues of classroom management. Whose fault is it if a student's outside link is broken? Moreover, who becomes the voice of authority in a dispute over what that content once contained?

This problem extends into the issue of the online image itself. From a corporate perspective, one of Ulmer's great weaknesses is how he skims over issues of the image as flexible and evolving. He asks his students to select an emblem, one which “represents a version of the wide image [which...] exists as a pattern that you discern in the four separate fragments of the mystery” (Ulmer, *Internet Invention*, 276). The text tacitly assumes, however, that these images can be drawn from any online resource—it puts no constraints around copyright or image ownership. Most copyrighted images on the Internet are not watermarked, or even locked, and it is easy to drag most images to your desktop. From there, they can also be uploaded into

PhotoShop and shifted, changed, and patterned. Even when images are protected inside a locked PDF, capturing them takes no more effort than a screengrab (apple shift four on a Mac), and the image has been set free from its original source. From a publisher's perspective, allowing students to work with and "publish" such images could violate copyright law. I realize this is a limiting factor most college classes do not need to worry about. However, copyright law is a serious concern for major educational publishers. If, as I have posited, a truly successful large-scale platform needs corporate backing, these issues will need to be addressed.

The issue of copyright aside, however, the most important point in electrated mystory, and in Stephanie Evans's narrative, is not just nonlinear construction—as she herself points out, a nonlinear approach is equally possible in printed texts. A printed book can be "consumed" in a similarly fragmentary way by flipping pages to random points, as magazines are often read. In the print-based literary field, mosaic memoir writings and postmodern fiction are commonly composed in much the same way. Perhaps the *difference* in meaning that Evans is grasping at lies in how she represents herself through the fusion of text and image. Instead of starting with the process of outlining, she searched existing websites to find "those that expressed myself pictorially. My next objective was to create new links between them" (Evans "Introduction"). In one of her mystory pages, weapons and gunfire are illustrated by cylindrical lipstick tubes, while on the next link a sentence that describes her childhood role in beauty pageants is illustrated by standing bullets. The images are not as static as they would be in a printed text, either. In Evans's "Project III: Historical" section, Flash animations of lipstick and a pageant crown blink on and off an image of a whale shark.

The nonlinear and even schizophrenic behavior of Evans' images (now whale, now lipstick) speak to the core meaning of mystoriological theory. As this theory advocates, she has

dutifully unmoored her composition from the traditional schema of linear structure. Ulmer himself underscores this difference on his website's "contrast" link, labeled "For an overview of how NOT to compose a mystery." This link leads to a commercial site that offers advice on how to write a research paper. From "Step 1: Choose a Topic," to Step 8: Type Final Paper," it provides a logical, linear approach to investigating a subject. Ulmer's mystery, logically, sets itself up as the converse—in the world of Ulmer, illogical leaps and nonlinear structures are to be sought out rather than rigorously eliminated. One of the primary strategies for accomplishing this goal according to the theory is through the manipulation and (re) construction of the image.

This fundamental centrality of the online image is addressed at many points in the theory of mystery. The wide scope image is key to Ulmer's re-envisioning of digital rhetorics, and his website underscores the view of the image as:

wide when it functions as a schema capable of assimilating [sic] to itself a wide range of perceptions, actions, ideas. This width depends in part on the metaphoric structure peculiar to the given image, in part on the intensity of the emotion which has been invested in it, that is, its value to the person. (Gruber, qtd in Ulmer "The Image of Wide Scope")

In this sense, the image is imbued with the almost magical power of the symbolic. It comes to stand as a metaphor for the author. It is not yet clear what disruptive implications this process has had, or is expected to have, on classroom practices. I would have liked to see Ulmer address this issue more directly. As Tapscott and Williams point out, "the new Web—which is really an internetworked constellation of disruptive technologies—is the most robust platform yet for facilitating and accelerating new creative disruptions" (31). Far from encouraging the shrapnel-based process of collaborative disruption, Ulmer seems to be laying out an inward-looking

solution. Despite its theoretical links to the main institutions in the convergence of discourses that Ulmer terms the popcyle, Evans's mystory is composed along wholly personal lines. Admittedly, Ulmer is far from naïve about the principles of the collaborative web—he even says that

dialogue in the new literate institution of School [...] relied on an atmosphere of friendship and trust: participants could set up their defenses and the need to win the argument in order to learn and discover the true state of affairs. In the new electrate institution of the internet, conditions are somewhat different. The interbody metaphor must mediate a global encounter among strangers in an atmosphere of compassion fatigue, indifference, or misunderstanding, perhaps even post-traumatic stress disorder (PTSD). (*Internet Invention*, 155)

The metaphor of the “encounter,” however, is vastly different from that envisioned by Tapscott and Williams. In lieu of their collaborative Shangri-La of collaboration, Ulmer sees Gulf War veterans staggering home, shellshocked. Who is in the right, here? Is the world of the modern Internet, as Ulmer suggests, such that “the channel, the connection along with the given circumstances of the senders and receivers, are in ruins” (*Internet Invention* 155)? In contrast, Tapscott and Williams see today's Internet as “a shared canvas where every splash of paint contributed by one user provides a richer tapestry for the next user to modify or build on” (37). While Ulmer envisions the student's role as artist-navigator within chaos, Tapscott and Williams see it as an enthusiastic, collaborative explosion.

Through this lens, it seems that Stephanie Evans's *Mystory* does not illustrate the perfect application for Ulmer's theory. It fails to deliver on the feeling of PTSD in the global encounter. Nor perhaps can it, dependent as it is on the technical programming skills of the average

composition student. It is important to acknowledge that digital natives are not necessarily expert digital manipulators. In fact, many of today's students move through interface worlds so seamlessly constructed that no programming knowledge at all is needed to interact with the environment. This is arguably the biggest weakness of all in the gap between mystoriological theory and application—there is no easy way for an unskilled student to create something like Evans's mystery. The process of original creation on the Internet is difficult and technical. Even products that allow people to communicate seamlessly (Facebook, Twitter, the trappings of the social web) serve as a means of enabling "skill-free" online interaction through a very sophisticated back-end engine. It's a classic trap. Without this kind of engine, teachers using online mystery would also need to teach students html, Flash, Photoshop, and more. To build and host a sustainable engine, however, some type of bargain must be struck with a corporate or grant-based source of funding.

This is a serious blocker to the realization of Ulmer's theory, which depends in large part on the lack of control by a specific institution. At its heart, however, Ulmer's theory is still important—and even revolutionary—in the way it envisions these institutions. The wide image is seen as representative of the four discourses in the popcycle. Ulmer's "Allegory Popcycle" begins by acknowledging school as a codified and formal institution in its own right. Ulmer calls school the "literal" discourse, defining it as "the history of one's nation, state, or community—the official version—as codified in textbooks taught in elementary, middle, and secondary schools" (*Internet Invention*, 81). Calling out textbooks as the means of knowledge codification and transmission is far from a random decision. The academic world in which American students live is still grounded in the discourse of printed textbooks, even while teachers struggle to find ways to engage students through technology. This discourse does not seem to be particularly

well-represented in Evans's mystery. Her story is too inward-looking, despite a few oblique references to community history, such as the construction of Flagler's railroad.

Ulmer's second category in the popcycle is allegory, or the discourse "of cultural mythology encountered in popular genres (Westerns, film noir, comedies, soap operas) carried through the media—television, cinema, newspapers, magazines, advertising" (Ulmer, *Internet Invention*, 81). It is interesting that, even for 2003, Ulmer was clearly thinking in the language of the digital immigrant. Mobile phone apps, social networking sites, MMORPGs, and other technologies—media just about to rise to prominence in 2003—host their own genres, now far more popular than those Ulmer names. Who you build yourself as on the Internet, whether on Facebook or in *World of Warcraft*, is made up of equal parts reality and mythology. Stephanie Evans—glimpsed only briefly as a child in her mystery, cut up into puzzle pieces—seems to compose herself more of myth than reality.

Ulmer's two other popcycle categories, Moral and Anagogy, are less relevant to my analysis. In terms of vocational and corporate training courses, such as engineering simulations, disciplinary knowledge certainly applies, but for the purposes of this analysis I take Ulmer's second category and posit it as an extension of the literal. The lives of digital natives are already saturated with crossovers between the two. Evans focuses almost solely on the third category, Moral, which Ulmer defines as "Family (biography of the individual)," and Anagogy/Career is visible only in her knowledge of mystery itself (*Internet Invention* 81).

It seems clear that, while she makes a fine effort, Evans's mystery does not entirely embody the principles of theoretical wide scope. What, then, is the final goal? In mystery, this seems to be a fusing of the popcycle categories to produce meaning. As Ulmer puts it, "the premise of the wide image is that nothing is created or invented in general, but only within the

parameters and paradigms of the disciplines and professions that set the problems and determine the criteria for evaluating proposed solutions” (*Internet Invention*, 24). According to the rules of this statement, the determination of meaning in a digital environment is less a matter of inventing new taxonomies than it is the manipulation of those that already exist. “At the same time,” he points out, “it is important to remember that knowledge domains are invented” (Ulmer, *Internet Invention*, 24). The term “invented” is important here for more reasons than one. In the business sense, the ideagora presents great possibilities. As Tapscott and Williams ask, “why can’t a retired corporate scientist or an aspiring Ph.D. student use ideagoras as an outlet for their great ideas and an opportunity to solve problems for some of the world’s most advanced companies?” (100). The ideagora—the marketplace of the networked web—serves as both outlet and inlet in a constantly circulating sea of invention.

To successfully apply the theory of mystery to the broader practice of eLearning, then, it seems vital that we allow students to interact with and change their environments. Once again, this idea has potential for positive transfer. The flashes of insight that come with the self-definition of problems are precisely what is needed both in the world of education and in the corporate marketplace. What Tapscott and Williams say in the context of the corporate marketplace is no less applicable in the world of education. They claim that as companies “embrace the principles of wkinomics—openness, peering, sharing, and acting globally—these ideagoras will come to fruition, fueling an increasingly active trade in technology, intellectual capital, and other key innovation ingredients” (Tapscott and Williams 99). Switching the term “companies” for “educational providers” gets us closer to the philosophical point of the mystery.

This point is very closely tied to the “aha” moment of invention. Ulmer writes, “Such is the prospective nature of the widesite: not to wait for the flash of insight, but to write (design) it”

(*Internet Invention*, 114). The implication here—that play is what creates insight—is one of the driving forces behind the social web. Insight in the modern world manifests itself in much the same way Ulmer references the widesite, saying it “*is to insight what electricity is to lightning*: a means to put into a reliable practice a power found ‘wild’ in daily life” (*Internet Invention*, 114). The power of the networked web is beyond a doubt one of the wildest and most unpredictable forces in education today. Uncertainty and instability permeate classrooms, from issues of hardware and platform—as schools ponder mobile apps, interactive whiteboards, the 200 Linux laptop, and a host of other spiraling new technologies—to the systems themselves, as new modes of interaction spring up and wilt as fast as spring flowers. Pinpointing the next big Internet craze has become an unpredictable guessing game. As one recent CNN feature put it, “As 2009 draws to a close, with Twitter undoubtedly this year's media darling and Facebook continuing on its path to global domination, you may wonder which social-media service will become tech's poster boy in 2010” (Cashmore para. 1). The article attempts to predict a candidate—Foursquare—but in so doing admits that the true answer is anyone's best guess. In this uncertain landscape, educators face the daunting prospect of trying to find educational apps that use the most current and engaging technologies (“what's cool on the street”), while publishers and other educational providers struggle with a development timeline that is not nearly agile enough to account for the sudden emergence of a Foursquare.

One possible solution to this problem is to use Ulmer's paradigm and tap into the user base itself. As Tapscott and Williams suggest, we need to understand the web as “a library full of chatty components that interact and talk to one another” (38). The metaphor of the library is immediately reminiscent of Ulmer's popcycle institution of school. The term ‘chattiness,’ far from being dismissive, also gets at an element of electrated composition that Ulmer largely

overlooks. The element of casual chat—as far from PSTD as one can get—forms the core of motivation in Tapscott’s and Williams’s view. To unlock the “chattiness” achievement, however, developers and instructional designers must create a platform compelling enough to motivate user participation. The concept of the interactive user is far from new to the world of the Internet. Industry models now commonly use APIs, or application programming interfaces, which allow third-party developers to build almost anything they desire on top of the existing network. Apple’s famous iPhone apps, built by and distributed through users, are perhaps the best-known market example of APIs; the users, at both the high school and college level, have become accustomed to the ability to alter their online environments.

Alteration—a pervasive theme in Ulmer—is now an established part of Entertainment discourse. One excellent industry example is the external-gameplay structure of *World of Warcraft*. Sites like Thottbot, user-driven and largely user-created, include detailed directions on how to complete quests, complete with user-altered screenshot maps marked to show quest locations. Taking this concept one step further, third-party designers create their own add-ons for the game—in the *World of Warcraft* analogy, apps such as Bartender, Carbonite, and Auctioneer synthesize data from the game and provide tips and directions for quests, gear choices, and sale prices on the auction house. The motivation for this development seems less tied to economic gain (in fact, nearly all the apps are free), and more based on a sense of intersocial involvement: the game is *life*.

While this model works well for entertainment genres, there are still clear issues of control in educational applications. As Weinberger puts it, the paradox of the collaborative web is that “as we pull the leaves from the trees and make a pile of the miscellaneous, we free the leaves from their implicit context. Compared to trees, piles of leaves are devoid of meaning”

(165). The rigid taxonomies of the traditional textbook are meaningful in their very rigidity; to teach a taxonomy, it must remain a stable system. Online taxonomies get corrupted in the muck of the Information Age—as the third-party developers work, they change the meaning and definition of the things they build on top of. The nature of meaning becomes increasingly uncertain, and while on the taxonomic end there is “a simple definition that one can look up in a dictionary. At the other end, meaning is the broadest terms for what gives value to our lives. There is reason to think of it as the implicit and unspoken” (Weinberger 169). Ulmer’s insight in the context of the modern web is almost certainly both implicit and unspoken. In his cryptic interpretation:

The storehouse managed by digital mnemonics is the internet, and while the resources and concerns now are different [than that of the Medieval book], the coordination of multiple discordancies and scales, *designed by each student* to facilitate storage and retrieval of information, is the same in the mystory as in the ark. (Ulmer, *Internet Invention*, 110)

It is the theme of the student-designed *arca sapientiae*, or book of memory, in the digital realm, that proves so tricky to define. In Hugh of St. Victor’s approach to the Medieval program of education, the ark is the place where “the narrative of historical events is woven together, here the mysteries of the sacraments are found, here are laid out the successive stages of responses, judgments, meditations, contemplations, or good works, virtues, and rewards” (qtd in *Internet Invention*, 110). Within a suite of printed texts, meanings and events become part of a program of study. On the modern Internet, however, the big “pile of miscellaneous information contains relationships beyond reckoning. No one person is going to be able to organize it in all the useful

ways, hanging all the leaves on the branches where they might be hung” (Weinberger 105). To continue Ulmer’s metaphor, the ark is far too large for one person alone to build.

The question of digital modes of organization may well be too large for any one final solution. In the context of mystory, Ulmer attempts to solve this problem by directing his analogy into specific elements of discourse. He writes that for the mystorian, the ark “derives ‘moralia’ from family upbringing, history from social studies (as taught in secondary school), and allegory from entertainment (lives and dramas of media stars)” (Ulmer, *Internet Invention*, 111). To rephrase this statement outside the context of the mystory, the modern humanities student must create meaning from a mosaic of personal experience, historical understanding—perhaps most typically taxonomic, or authoritarian—and societal awareness. In an online environment, this kind of task demands a highly engaged and active student body. Motivation thereby becomes the key to the mystory’s success.

One of the central factors missing in modern educational media is motivation, and this is a central theme missing in Ulmer’s work. For the most part, he tends to assume that students are motivated, as he is, solely by the process of discovery. While this may be true for his college courses (and if so, he is lucky), it is not true for the larger discipline of education. This is probably true in part because school has become a fetishized institution in modern America, an entity almost entirely removed from most students’ “reality.” In fact, freedictionary.com defines the term ‘fetishize’ with a quote by James Traub that says, “The American public schools . . . have in the space of a few years gone from neglecting computers to fetishizing them” (“Fetishize.”) Dragging schools into the Information Age is almost certainly a task too great for this dissertation, but there are still compromises that can be made. For one thing, the majority of educational games have a major disconnect from mass-market games in that the former are all

are missing the key motivating factor of what I term *Stuff and Status*. To take one of the largest MMO communities as an example, *World of Warcraft* has set up an intrinsic motivation structure that supports literally months of mindless repetition, math calculations, and complex game strategy. The game accomplishes this feat through the powerful twin motivational matrices of *stuff and status*.

Stuff is perhaps the more straightforward category. Just as in *Gaia Online*, where a giant chicken mount provides motivation for endless drill-and-kill tasks, mastering repetitive tasks in *WoW* can earn the player special gears, pets, and mounts with “cool” factor. A rare dragonkin pet, for example, sells for hundreds of game-gold, and a brewmaster outfit signifies that you have devoted ten days to doing all the Brewfest dailies, some of which are extremely labor-intensive and skill-based. The latter example is where the line starts to blur between *stuff* and *status*. Certain kinds of *stuff* gain you *status* in the in-game social hierarchy—for example, purple or tan armor acquired past the level cap. On certain raid missions, the group leaders will thoroughly inspect and kick from the group any player who fails to meet the *stuff* criteria.

As a side note, this is yet another important factor that is not present in Ulmer’s theory: the dynamics of competition. Classrooms are by their nature designed to be competitive. The student competes against the content (in the case of individual assignments or group work) as well as against the other students (in the case of a bell curve or grade point average). Still, many U.S. classrooms attempt to mask this fact by deemphasizing competition, and many of the digital games produced for U.S. schools reflect this approach. Ironically, the element of competition is precisely what helps make mass-market video games and MMOs so successful. Beyond the “*stuff and status*” basics, players in *World of Warcraft* can battle each other or the NPCs in the game. PvP (player-versus-player) interaction in battlegrounds and in duels offer opportunities to

gain both reputation in the peer group and elite gear through the redemption of honor tokens. The PvE, or player-versus-environment, segment of the game allows for greater collaboration through a common game narrative. Players group together to defeat elite NPCs and the help each other out through combinations of skills. A level 20 priest, for example, is a cloth wearer who cannot survive well against attack from PvE monsters. What that character can do is team up with another live player who has a tank class, like a warrior. The first player's healing spells will in turn keep the tank player alive as he or she takes the hits from the game environment. Collaboration in shared goals helps bond the users together to form a game society.

While Ulmer is undoubtedly focused on self-representation, he fails to construct a self-motivating and evolving community in the sense that MMOs are able to. Despite these flaws, however, electracy is perhaps most important in terms of its application to the teaching and learning of innovation. In the "Office" section of *Internet Invention*, Ulmer states that the project is "an experiment in heuristics (the logic of invention)" (42). The entire book can be seen as an experimental way of thinking about invention, and it ironically seems to have been more successful at this goal than its students have. Invention is an increasingly vital element, not only in theory, but in practice. It is that very attribute which global economists such as Meredith have highlighted as the key to the economic future of the United States. In 2006, the Council on Competitiveness called for "legislation that would encourage innovation: they called on the United States to 'innovate or abdicate' its global leadership role" (Meredith 203). To pinpoint the reasons that innovation is lagging, many look to the failures of the U.S. school system. As one international business perspective puts it, the United States is not "training our K-12 grades. Yes, we have the best university system in the world, but we're not feeding that system. We're not investing in creativity" (Chen qtd in Meredith, 207). The key skills required in Ulmer's theory of

internet invention are the very skills so desperately needed in American schools. How, then, do we put them into practice as a learning model at multiple levels? The mystery does an exceptional job of quantifying and measuring creativity, which studies indicate “is close to 80 percent learned and acquired [...] We found that it's like exercising your muscles—if you engage in the actions you build the skills” (Gregerson qtd in Tutton). If, as Meredith claims, creativity and innovation are *the* key differentiators in America’s future success, then the teaching and learning of creativity is arguably far more important than the drill and kill elements of NCLB.

So how is this information useful to the theory and practice of educational learning modules? Ulmer’s model lacks the necessary framework, yet it’s difficult to imagine an educational publisher able or willing to invest the money and development time required to develop one. In the end, there is no selling point to his application. *Internet Invention* ends on a somewhat querulous note, asking “*What’s Next?*” but making little effort to define what that next stage in electrated evolution should be. I would argue that smaller-scale MMORPGs and immersive environments offer “quick win” models based on motivational matrices very similar to Ulmer’s basic principles of electrated thought. Ulmer himself uses the language of the fantasy game at many points, telling students to do things like “look again at the entertainment narrative you represented in your mystery. See if you can locate in its plot the stages of the initiation quest” (*Internet Invention* 182). I argue that it is within the interstices of Ulmer’s “entertainment” and *World of Warcraft*’s “entertainment” that the real possibility begins.

CHAPTER 3: THE STUFF AND STATUS MODEL

“If you’re not prepared to be wrong, you’ll never come up with anything original.” –Sir Ken Robinson, TED Conference

The “entertainment narrative” of Ulmer’s theory is quite literally being put into play in today’s schools as gaming applications proliferate. Although no one model has emerged for widespread implementation, the September 15, 2010 edition of *The New York Times* profiled some of these emerging classroom technologies, including a pilot system known as Quest to Learn. The *Times* notes that “once it has been worked over by game designers, a lesson doesn’t look like a lesson anymore. It is now a quest” (Corbett 2). This process of “working over” naturally takes place as traditionally academic content is translated into online modes. A kind of tension thereby develops between NCLB’s focus on quantifiable SME testing, and the translation of those curricula into digital frameworks. One of the stated core principles of Quest to Learn, for example, is the commandment that “I [the student] take risks, make meaning, and act creatively and resourcefully within many different kinds of systems” (Salen *et al.* xviii).

Risktaking within schools—particularly in a digital realm—is a scary prospect for many. As Sir Ken Robinson pointed out in an inspiring 2006 TED speech, America as a society tends to “stigmatize mistakes. And we’re now running national education systems where mistakes are the worst thing you can make. And the result is that we are educating people out of their creative capabilities” (“Schools Kill”). In contrast, mass-market online games tend to be exploratory and multipurpose. They reward players for creativity and for the very kind of risk-taking that Quest to Learn calls out as fundamental. The process of translation is therefore difficult and troubled.

James Gee calls out the root of this disconnect when he says, “If you think about kids in school—especially in our testing regime—both the teacher and the student think that failure will lead to disaster. That’s pretty much a guarantee that you’ll never get to truly deep learning” (qtd in Corbett 8). To make this kind of fundamental change in the educational system will take more than just a focus on the entertainment value in games. In fact, it may take more than just games in the first place.

It is admittedly easy to see why eLearning skeptics are uncertain about the long-term effect of gaming on cognitive development. As Oppenheimer puts it, “high technology is steering youngsters away from the messy, fundamental challenges of the real world—and toward the hurried buzz and neat convenience of an unreal virtual world” (411). In a certain context, games do exactly that. No matter how sophisticated the game, the world, players, and actions inside are still highly surreal and constrained by the “neat” storyline set by the game’s developers. In a traditional linear game, there is also a beginning and end without much possibility for continued existence outside the game. That is why educational gaming must do more serious investigative work on another model beyond that of the simple linear game. That platform, that of simulative and avatar-based worlds, is based more on the creation and maintenance of a player’s virtual self. Perhaps more importantly, this kind of immersive environment can run as a beta, incorporate new and interdisciplinary games or “expansions” at whatever level the developers (or educators) would like. Much as live-broadcast television transformed sporting events, like football, into juggernauts of popular entertainment, the possibility of real-time interaction in immersive online environments can fundamentally transform education.

Understanding the principles that make a mass-market immersive environment attractive for long-term players is the key to success in the educational market as well. In the mass-market, motivation is created largely through two kinds of motivation—what I term *stuff and status*. In talking about this matrix, I quite purposefully use these rather childish terms because they quite simply evoke the feel of gameplay. The motivating factors for *stuff and status* are more complex than they may initially appear. For one thing, *stuff* can be motivating through a kind of intrinsic coolness factor, or in the sense of game advantage. This ties *stuff* to *status* in a complicated fashion. For example, it is difficult to predict for sure which of these two factors motivates a player in *World of Warcraft* to spend quite literally months completing the quest series for Shadowmourne. The huge, glowing battle-ax certainly counts as *stuff*. But the true motivation for doing the quest chain—which includes thousands of kills and numerous 25-man dungeon runs—is the *status* conferred by killing the Lich King and beating the end-game. Imagine being able to tap into this kind of motivational power for education. It would truly be the holy grail of the modern classroom.

For this kind of intrinsic reward system to succeed, it is necessary to create a gameworld. The ideal model is probably a pervasive and enduring immersive learning environment that is based on a real-time community and stocked with virtual items. For one thing, the human beings on the other side of the computer must be able to interact with one another over time in order for *status* to fully come into play. A kind of economy must also be in place to allow for the acquisition of *stuff*. Whether items are “won” through in-game play or “bought” through tokens earned in the larger environment, the process of acquisition is an end in its own right. As one author on *Cracked* puts it, “There' [sic] little more satisfying than taking three hours to prove to people you now likely hate that you have what it takes to complete a series of disconnected,

mundane tasks and collect more arbitrary tokens of success than they did” (Swaim). This tongue-in-cheek assessment gets at the heart of the motivational matrix in mass-market video games.

The mundanity of the task is easily offset by those arbitrary tokens of success.

Mundanity is easy to create. For this reason, worlds based on immersive social orders are often linked into a series of small games and spaces, rather than one overriding game narrative. The modular and non-linear form of these kinds of games also offers to opportunity for beta development and progression, the same kind of structure Ulmer references when he posits the EmerAgency as “as a framework to motivate the website projects”(Internet Invention 1). It is for this reason that my case studies begin from the point of examining two growing social networks in which students and users ‘live’ experiences in place and time. Neither wholly real nor unreal, the avatar-driven worlds of *Poptropica* and *Gaia Online* function as intriguing models of task acquisition and didactic purpose.

On the surface, the two sites have little in common. *Gaia Online* is a somewhat perverse user-directed networking site, while *Poptropica*, an iterative gameworld launched in September of 2007 by Pearson Education, targets users as young as preschool level. *Poptropica* is an RPG with little possible deviation from the game narrative, outside of the new “Multiverse” feature. Perhaps the most salient feature of *Poptropica* is that it is being developed as a beta. When the game was first launched, it was composed of only one island, “Early Poptropica.” There, players could interact only through a pre-scripted series of “safe chat” terms. There were a few mini-games available in the arcade, all of which were ostensibly played with other live players inside the Soda Pop Shop, but there was no way to communicate or form in-game relationships with other people, and therefore little point to playing them in sudoku or hoops. When I first played the game in Fall of 2007, figuring out the purpose for the larger island outside the mini-games

was a challenge. There were a series of towers to one side, a sewer filled with spiders beneath, a frontier village, and a series of apparently disconnected landscape elements. Educational themes popped up with no apparent connection, as in the PopArt museum, where miniature Van Goghs, Seurats, and others wandered the galleries with no apparent purpose except to tell you who they were.

In retrospect, this first island was almost certainly meant as an experimental testing ground. Its schizophrenic elements form an ideal arena for testing how students respond to different features, and items like the PopArt museum were probably a first stab at how best to work in educational content. At the time of this writing, three years later, the game has more than a dozen islands, all of which explore different disciplines and genres. Shark Tooth Island, for example, has science content. Nabooti Island is a “choose your own adventure” portal linked to the print book series of the same name. Nabooti is one of the more interesting examples of partnership evident on the site. From the first, *Poptropica* has essentially been a free-access site, which means that there is no obvious revenue stream to help pay for its development and upkeep. Pearson Education is no non-profit, either. Over the past three years, however, *Poptropica* has played with different ways to make a profit from the site. These strategies have ranged from simple banner ads to advertising “quickie games,” like early 2010’s Nanny McPhee game, which advertised the movie as players competed against the clock to win their own Nanny McPhee pig. It is hard to imagine the ROI from Nanny McPhee’s pig being successful enough to support a development team, however. Perhaps that is why, as of 2010, *Poptropica* also offered a subscription model and a cash shop.

Regardless of how pervasive advertising is in *Poptropica*, however, the concept of advertising as a support model for children’s games remains a serious issue. While the children

themselves are unlikely to care deeply, *Poptropica*'s decision to include advertising could lose them their parent base, alienate academic audiences, and have adverse affects on how the game is represented in the press (it is worth noting that in the past three years, no major controversy has arisen over advertising). Some academic projects, such as *Quest Atlantis*, get around this issue in part by allowing sponsorship of the game rather than in-game ads. In this sense, the target audience is more the adult parents and educators. *Poptropica* publisher Brallier, on the other hand, sees advertising as a way to work kid-friendly content into an engaging online world. From Brallier's perspective, "it's like we're inventing a Penguin or a Random House. You can engage with a book online and on the page. The *Diary of a Wimpy Kid* books prove one doesn't have to think of the Internet as a threat" (qtd in Rosen 6). The books Brallier mentioned, which were originally published in digital form on the same site that hosts *Poptropica*, are now a successful print children's series. They are also one of the products now advertised on *Poptropica*. I argue that this particular strategy of advertising—for children's literary products—makes a lot more ethical sense for the game than the Nanny McPhee movie does. After all, "book content and comics are hidden among the site's nine quests, or islands" (Rosen 6). If the game can get children interested in literature through gaming, that might indeed offset the negative aspects of advertising. Books, much like healthy eating, exercise, and an interest in the arts, can hardly be seen as negative influences for children—particularly children who are playing an online game.

While no responsible academic project would seek to use children as money-making ventures, I argue that we need to revisit our concept of advertising. Not all "advertising" is innately bad or manipulative, as is sometimes assumed, and an online environment with educational content could do a lot worse than to convince children to buy books—for that matter,

any interest in books is quite often lauded in today's educational system. As Rob Weir's fantastically humorous account of the modern reading crisis puts it, "The professorial mantra of the 21st century is: 'They just don't read'" (para. 2). Weir's approach to solving this problem at the college level is very much a blend of threat and reward. One of the comments on his article, however, provides a great deal of food for thought about advertising and how it plays into the global (capitalist) economy. Writing in response to Weir's classroom management suggestions, a blogger posting as 'Muriel Slash' writes:

Most students are not naturally motivated. They must be motivated from without. Only in a utopia would they be self-starters. Most college students are preparing for the workforce where they will be 'carroted' with the lure of job security and 'sticked' with the probability of none. Globalization is imposing more discipline on workers all the time. The ONLY balm to that is mindless consumerism. Let's educate them accordingly.
(Weir)

Slash's comment evokes some disturbing possibilities about education as a whole, as well as the role of consumerism in that process. Her post is clearly sarcastic, yet it gets to the heart of the problem that the idea of advertising in children's games brings to the surface: If big corporations are responsible for developing online materials that educate students to function as part of a consumer economy, is it hopelessly utopian to expect them to do so in a world devoid of advertising? At the same time, nobody—whether they speak for corporate, educators, or for the public sector—wants to endorse the 'carroted and stucked' future of Muriel Slash.

The optimistic and idealistic views of *Poptropica's* game philosophy seem like an interesting place to start. Indeed, Brallier's attitudes towards advertising reflect the game's willingness to embrace the playful and unconventional. The little avatars are cartoonish, wildly-

bouncing creatures, and players can use earned game credits to dress them up as a dragon, a shark, or a cheeseburger. This *stuff* (again, shades of commercialism) is earned largely by purchasing it with the credits that are earned by completing islands. The system of reward in *Poptropica* is worthy of further examination. There are few-to-no time-based rewards in *Poptropica*. Unlike Farmville, which punishes players by withering their crops if they aren't harvested on time, or *World of Warcraft*, which holds timed world-events, *Poptropica* allows the player to progress through the game largely on their own time. The exceptions to this rule seems to be timed mini-games (i.e., to get the reward from Pan, one must find 10 honey pots in 60 seconds), and advertising features, which allow a player to get a special item for a limited time (i.e. Nanny McPhee's pig). Arguably, the lack of time-based-tasks in *Poptropica* is most likely due to the site's target audience. Students at age six and under are unlikely to have the cognitive skills needed for a highly strategic and time-based game. While the audience for *Poptropica* may be younger, however, the motivations for gameplay remain largely the same. A "Stats" page inside the game shows the player's island medallions, battle ranking, and recent activity. Battle ranking is determined by the player's number of wins in "mini-games" against other players. Status is easy to get at first, but eventually becomes much more difficult, since to raise status level the player must beat other players whose star level is higher than their own.

Both in-game currency and status medallions are earned by completing islands. Time Twisted Island was the first to overtly tie learning objectives into the narrative. The student player is given a narrative context that tells of a mix-up in the time continuum, and to straighten it out they must use a time machine that takes them to 11 different historical time periods, ranging from ancient Rome to Sir Edmund Hillary's Everest expedition. The student player's avatar then interacts with each of these locations, in which he or she can jump, run around, and

otherwise explore the entire scene. How does it change a history student's learning experience to be able to see and walk through cities that have long crumbled to dust? What is lost (or gained) when those cities are wildly cartoonish fictional versions of their original selves? Whatever the answers may be to these questions, it is clear that *Poptropica* presents an experiential and nontraditional learning paradigm.

A model of experiential learning through a fictionalized historical environment challenges many of our concepts of academic instruction. Larreamendy-Joerns and Leinhardt posit that the two key understandings for online education are "first, that online education has evolved from previous conceptions of education; and second, that there are social, political, economic, and ethical assumptions and implications in what appear to be simple actions of design and instruction" (567). I would add a third category of understanding; the role of experiential understandings for digital natives. Perspectives on Internet worlds—not as an abstract, but as literal worlds—are fast evolving. In December of 2007, Craig Atkinson, group account director of OMB, stated that "the adoption for kids [worlds] is absolutely mind-blowing [...] The time spent on these sites is off the charts. It blows away regular, old static Web sites. Our perspective is, absolutely, that virtual worlds will become the next wave of social networking" (qtd in Shields). As the digital natives of the 21st-century grow up, an increasing segment of the population will expect more of the web than a static 2-dimensional interface. This leads to the question of the role world-building plays in eLearning environments from primary to postsecondary education.

Looking further down the instructional continuum, an elementary student who learns to navigate through an interactive virtual world may have the opportunity as an adult to transfer the social and cognitive knowledge to simulation-based workplaces. How then does this movement

impact the modal principles in educational game development? In the traditional (WebCT, Blackboard) web class, “static or dynamic representations are meant to support explanations, not replace them. In that sense, no amount of visualization can compensate for a thoughtful explication of concepts, processes, and procedures against the backdrop of conceptual principles” (Larreamendy-Joerns and Leinhardt 586). This assumption becomes problematic in 3-D virtual learning environments. For example, in *Poptropica*’s Time Twisted Island, there is little or no direction whatsoever for the student—there aren’t even help buttons, and the narrative consists mainly of exploring the world to try to figure out what is going on. Players are told that an artifact from each of the time periods has been misplaced in another, but from that point on they must just explore to see what they can find. Far from punishing mistakes, *Poptropica* encourages play. A mistake is correctable, but more importantly it is useful. On Mythology Island, for example, I accidentally discovered a starfish card by leaping around the statues in a seemingly empty temple. I had technically made a mistake in that the Grove of Temples was the first place I should have gone, to put Cerberus to sleep. However, the starfish card was also a necessary item for a step much later in the game, when it is used as an offering to open Poseidon’s kingdom.

In a nutshell, open and non-directed games like *Poptropica*’s encourage the very type of exploration and play that builds creativity. Students on Mythology Island are learning about Greek and Roman mythology, but they are also learning how to interact with those figures along the rules of play. As in most mass-market commercial games, the most specific instruction comes from a disjointed series of funnelling and breadcrumbing techniques. In some sections, the right character will give the player an artifact if they are approached and ‘spoken’ to. In others, the player must explore all areas of the scene to figure out where something is hidden. For instance, in Time Tangled Island, a lost piece of Aztec sunstone is hidden far out of sight on

the roof of Thomas Alva Edison's lab, and can only be reached by a series of complicated maneuvers that involve pushing an 1800s-era machine to one side, then using it to climb a tree, from which the player can jump to the roof of the lab. The roof and its contents are not even visible from the ground level.

For the most part, the preschool-age children playing the game seem to have little difficulty figuring out what to do. When they reach an impasse, they collaborate online to discover the answer. In August of 2010, Yahoo Answers had a total of 3,367 different question forums devoted to *Poptropica*. The ad hoc information network around *Poptropica* exists largely outside of the game itself, on everything from answer sites to fully-developed wikis. The development of an external information network speaks to the popularity of the game, but it also demonstrates a fairly sophisticated form of community problem-solving. Modern businesses are increasingly starting to tap into the power which the primary-grade users of *Poptropica* already grasp—when something doesn't make sense, they draw on the knowledge of others through the Internet. For example, in March of 2000, a struggling mining company whose engineers had been unable to locate metal deposits on their Red Lake property launched the “Goldcorp Challenge,” with “a total of \$575,000 in prize money available to participants with the best methods and estimates” (Tapscott and Williams 9). The company placed all its proprietary information on the web and opened the contest to more than 1,000 people in dozens of countries, including geologists, graduate students, and military personnel (Tapscott and Williams 9). In the end, the collaborators “identified 110 targets on the Red Lake property, 50 percent of which had not been previously identified by the company [and over] 80% of the new targets yielded substantial quantities of gold,” essentially catapulting the company from the brink of bankruptcy to owner of one of the most profitable properties in the industry (Tapscott and Williams 9). Far

from the old ideals of individual effort, the most rewarding tactics now often include the purposeful solicitation of help from networked knowledge communities. As Tapscott and Williams warn, “the new participation will cause great upheaval, dislocation, and danger for societies, corporations, and individuals that fail to keep up with relentless change” (15). The same holds true for academic groups as well.

What is wrong with an academic model that encourages students to seek out feedback and advice outside the classroom? Stereotypes of “cheating” aside, if students learn to process information by using a global support network, they will arguably be better equipped for the problem-solving processes being embraced by businesses today. Tapscott and Williams term the networked knowledge centers of the Internet “ideagoras, much like the bustling agoras that sprung up in the heart of ancient Athens” (98). Certainly, I do not mean to imply that all academic coursework is meant to prepare students for careers in business, but rather that the problem-solving skills gained through collaborative knowledge such as *Poptropica* blogs are applicable to almost any type of discipline or activity in the 21st century world. There are negatives to this process, and Tapscott and Williams point out that “the downside is that liquidity in nascent ideagoras is typically poor. In other words, there are too few buyers and sellers, and therefore too few transactions to make the marketplace a vibrant source of great connections and innovations” (110). The need to boost the level of “buyers and sellers” argues for a popular and widely-used immersive environment. To succeed in the academic ideagora, a game must also succeed in the public realm.

Both social and academic expectations must shift sharply when it comes to 3-dimensional RPG or MMO worlds. Textbooks almost always provide a clear path for students that includes instructional modules and help functions, but when we make the jump to a game like *Poptropica*,

we may need to conceive of other, non-linear instructional methods. Self-directed methods of exploratory learning suppose that “learners do not first understand concepts or develop a set of isolated skills and then confront scenarios requiring applicability. Rather, they are given opportunities for participatory practice and, as competencies develop, they seek and obtain supporting skills and concepts” (Larreamendy-Joerns and Leinhardt 590). This application model has bearing on the question of transfer as well. Teachers in classrooms from primary to postsecondary struggle to make scientific, literary, and mathematic concepts applicable to students in a more real sense than the ‘drill and kill’ method. In the self-directed model, the students in *Poptropica* learn a skill through the process of application, building historical knowledge almost subconsciously through their attempts to fix the tangled timeline.

It is possible to go far beyond the limits of *Poptropica*’s brand of interaction, however. As an RPG, or basic Role Playing Game, *Poptropica* limits the students to a fairly linear line of gameplay, in which they interact mainly with NPCs, and not with other students. The emerging “Multiverse” of *Poptropica* may change this paradigm in future, but it is still not clear how. Certainly, there is no internal reinforcement from teachers or instructors along the way.

Larreamendy-Joerns and Leinhardt posit that:

Social interaction (i.e., student-student, student-teacher), more than student-content interaction, is viewed then as the privileged occasion for instruction because it sets the conditions for cognitive conflict to occur and provides students with opportunities to engage in negotiation of meaning and argumentation. Online environments that incorporate synchronous or asynchronous networks allow students to engage in argumentative practices. (591)

If this position holds true, then literal interaction between teachers and students as personified members of a virtual world may be the most valuable model for social interaction. It is for this reason that my analysis turns to the online social networking world of Gaia Online.

Gaia Online was founded in 2003 as a small start-up company based on the idea of anime-inspired social networking. Initially designed for teenage users, the site mushroomed overnight, and by early 2007 was home to more than 2 million unique users (Au para. 1). Until 2008, the main focus of Gaia Online was the discussion forums, although the site focused increasingly around “virtual towns where Gaian avatars can socialize (up to 100 in a single space), with apartments they can own, and treasures they can find [...] It’s just that 10% of total user activity takes place in the world itself” (Wagner “Move Over Myspace” para. 4). This paradigm changed with the 2008 release of Gaia’s MMORPG *ZOMG*, which was one of the first examples of a sophisticated MMO—complete with levels and competitive quests—being built on top of and added onto an existing community. The timeline and structure for *ZOMG* has great promise as a model for iterative game development. Gaia Online built the community long before the immersive MMO, and translated many elements of the larger community successfully back and forth between the two. While *ZOMG* functions as a 3-d world in which avatars can move at will, in much the same way that a traditional MMO does, it allows the existing avatars inside Gaia Online to play exactly as they already are. Many of the items earned in the game can be auctioned off within the economy of the larger community, too. It is the relative cohesion within the community that makes the ever-expanding world of Gaia worth examining in a pedagogical framework.

On Gaia, tiny avatars roam villages, shops, and towns. They sit together on fishing piers, chat inside discussion boards, and commiserate with each other over their inability to hit the

grunnies in pinball. At first glance, it is hard to see how this kind of environment could have any bearing on eLearning. Inside the Gaia Rally, it's not uncommon to see avatar dressed in MTV garb posing on a Scion hood while an emo giant squid avatar approaches and asks 'wat up, where u from' in chat. However, this system has several key models that shed light both on the principles of instructional design and on the mechanics of appeal. First of all, Gaia starts by building off of the known. In a constructivist approach to learning, "it is emphasized that learners need to search the web reflectively by comparing owned concepts, facts, and personal experiences to new information, and starting a process of mutual adaptation" (de Vries, van der Meij, and Lazonder 650). Human identity is possibly the most basic starting point for owned experience. Gaia begins by setting up a human-looking avatar that can choose between a range of different worlds. Some, like Towns and Theaters, offer settings that are highly familiar. Others, like ZOMG, are populated by lawn ornaments come to life, giant lightening sharks called OMGWTFs, and other similarly surreal elements. At the same time, players have the choice to make themselves appear either human, or extremely surreal. Evolving items can give the avatar mecha-skin, demon horns, or even turn the human into an inanimate object, like a vase. The users have the capacity to figure themselves as human, cyborg, or entirely unhuman.

All this figuring is tied back into the elements of stuff and status, of course. At its simplest level, the avatar blurs the barrier between the human being in the desk chair and the online world composed of pixels. The Gaia Online persona is dressed in "stuff" that varies widely in virtual price. A representation and extension of the self inhabits that unreal world. That projection, while positive in a sense, has also been seen as potentially misleading, and "alterations in digital self-representation can have a large impact on how a person behaves in virtual environments—a phenomenon termed The Proteus Effect" (Yee and Bailenson 3). At its

most basic level, this effect refers to avatar-based standards of attractiveness. While Yee's research was initially based on realistic human avatars, it is reasonable to assume that whatever a discrete system develops as an "ideal" will be the measure of the Proteus Effect. The avatars closest to that internal ideal will be viewed and treated more favorably by others inside the game. Including non-human options and items within a huge price range—the rarer items sell for millions of gold, while the "starter outfits" are free, yet sneered at—effects in-game status in ways that we cannot fully guess at.

Moreover, *stuff* is funny inside the world of Gaia. The air of the ridiculous is always there, and the ability to bolt across a park while riding on a giant chicken gives Gaia Towns a sense of the surreal that is highly appealing. At its most basic level it is entertaining, which is an element not always seen in educational games. The entertainment value of the unexpected also helps keep the relatively familiar-looking town and shop settings engaging—the familiar may ground the user in prior knowledge, but the ridiculous serves to give people a sense of special belonging and enjoyment. Moreover, the irreverent sense of humor on Gaia does a lot to add to its level of cognitive engagement. In Barton Boutique, players can spend 3750 virtual Gaia Gold to buy a piece of black and white avatar clothing called a colonial dress. The item description reads simply *If you were so gosh darn prim and proper, how could you let them KILL KILL KILL?*, at once an oblique historical reference and a snide commentary on Puritanical ideals. As a player, I laughed out loud and bought the item despite the fact that it nearly bankrupted me. Even serious eLearning developers should not underestimate this kind of appeal, because it is in part this kind of witty stage presence on the part of the administrators and developers that makes Gaia so successful. There is absolutely no reason that similarly humorous aspects could not be

worked into an educational portal, and I believe it would play an integral role in those nearly indefinable factors of learner-engagement.

Stuff and status are not the only motivating factors inside Gaia Online, however. Another, far more interesting facet is the sense of emotional identification many people show for their character. Allowing for vast freedom in the creation of the avatar does much to increase identification with the Gaia world as a ‘real’ place. Critical studies for the most part agree with this conclusion. In one case study of media effects on social preference, the results indicated that “the provision of an analogous real-time channel alone—be it audio, video, or avatars—was in this case sufficient to increase the experience of emotional closeness” (Bente et al 300). Emotional closeness is not on the list of subjects tested by NCLB, nor am I suggesting it should be, even at the college level. My point is rather that the sense of emotional attachment to one’s avatar identity in an environment like Gaia Online can cement the learner’s identification with the environment. An eLearning platform could benefit in a similar sense from the inclusion of avatars, particularly ones that persist over time, and carry over from one class and school year to another.

In an advanced model, the elements of physical expression present in face-to-face communication are even transferred into the virtual world, since “avatars can be expected to increase the salience of deictic gestures as they permit linking the nonverbal cues directly to the virtual environment” (Bente et al 293). On the simplest level, hopping up and down or around another player can indicate excitement or engagement. In Gaia Online, the members do not watch a streaming video on their computer screen; instead, they ‘walk’ into a theater filled with their friends and strangers and join in a collaborative experience punctuated by chat, people shushing each other from across the isle, and free laser pointers and popcorn that can be used to

skewer the actors on screen. In other words, it is an embodied experience somewhat similar to that of a real-life theater. To return to the question of what this attribute can mean to education, it is important mainly in the sense of engagement.

The next generation of students in American classrooms is already familiar with the working concept of avatars at play in virtual realms. In 2007, it was estimated that “each month this year, an estimated 24 percent of the 34.3 million kids and teens on the Web in the U.S. are visiting a virtual world [...] By 2011, that number is expected to soar to 53 percent” (Shields 24). We are rapidly approaching the tipping point where more than half the students in a given class will already have experience in an immersive virtual world. Using these worlds can help personify and humanize distance learning, and it can help lend experiential realism to simulative learning tasks. Bente et al argue that “More than video, avatars allow people to get together in a shared virtual world, that is, make use of spatial information and share tools and artifacts” (293). Users inside the world of Gaia interact with the world in ways highly analogous to real life. Online, you can ‘give’ someone a butterfly net as a gift, and they can then use it to catch insects in Towns, and the insects can in turn be traded for ink. Groups of people move through the space of towns in a coordinated series of social interactions involving Christmas caroling, snowball fights, and ‘chess’ matches between players dressed like chess pieces, moving on giant chess parks. While distance learning has been criticized for its effect on social development, a representational world like that of Gaia would allow its characters to interact in much the same way as they would on a playground or baseball field.

Gaia Online does an excellent job of creating motivating factors for achievement, and it quite often does so through its manipulation of the unexplained. The role of curiosity in scientific and social advances is undeniable—rarely in the real world are great accomplishments made by

following a predetermined path. In Gaia Online, the game narrative incorporates a certain element of mystery as well. As a player, I spent several days playing the fishing game, in which my avatar sat on a dock with others, catching an increasing number of guppies, bass, and stripers in a virtual lake. It took me about three days to learn how to keep the fish from escaping, and another week to realize that I could trade fish my in the Fishing Hole store at Barton Town shops. However, I was never told what I could trade my fish for in the shop, and I had to figure out as I went what the end result was going to be. For example, I was unable to see any trade options at all until I got 10 guppies of the same color, but once I did I was offered a trade for one bass. Once I had ten bass I was offered a trade for a striper...and in the end a 25+ number of stripers became tradable for pieces of clothing, such as a guppy trucker hat.

As ridiculous as the above example may seem, there are thousands of players fishing at any given time, devoting a significant effort to acquiring the skill sets necessary to succeed. In an educational context we could ask for nothing better than this kind of devoted attention. There are limitations around our ability to implement this kind of structure, however. For one thing, the kind of full-disclosure and instructional guidance mandated by traditional pedagogy would be limiting. Knowing that there was a standard grading structure (3 guppies=F, 15 stripers=A, 154 guppies=15 stripers, etc.) would eliminate much of the sense of personal agency. An eLearning environment with layered complexity and an element of mystery encourages exploration and innovation on the part of the learner. Inside Gaia, the users may not be acquiring academic skill sets, but it would be reductive at best to say this means they are not learning. Despite the lack of pedagogical purpose, the player in Gaia Online is learning a series of strategic and exploratory skills both on the literal level—moving the mouse in the correct way so the fish doesn't get away on the line—and on a more complex level. Different lakes are home to different fish, and higher-

level gear will help you watch them. In fact, to figure out all the things that you can do to catch and sell your fish requires both repeated inquiry and spatial exploration. Bateman notes that:

most successful videogames involve repetition – either to learn the skills to progress, or to hoard the supplies (including experience in cRPGs) needed to succeed. Great stories thus far in history have never been as repetitive as videogames, which makes it difficult to know how one would make a great story in this new form. (“Great Game Stories”)

Gaia Online, like many immersive virtual environments, quite often involves games set within a narrative context that would be seen as inane and childish by serious academic standards.

However, a successful eLearning game narrative must necessarily involve the same kind of level of repetition as a commercial game in order to teach skill sets, a truly literary storyline becomes highly difficult to implement. In that sense, academic developers are partially handicapped by our own knowledge of literary narrative. It simply does not apply to the annular patterns required by game stories.

It all goes back to *stuff and status* in the end. Like most immersive worlds and MMORPGs, Gaia models a scaling system of advantages for *stuff*—the better you do, the better items you can afford, and therefore the better you can do in the future. The Gaia system is unashamedly capitalist, with richer people having access to better equipment. In the fishing game, a 13,050-gold distance rod *PLUS* makes catching fish about 75% easier than it is with a free basic rod. As David Wong points out on *Cracked*, “People scoff at this idea [of virtual items] all the time (‘You spent all that time working for a sword that doesn't even exist?’) and those people are stupid. If it takes time, effort and skill to obtain an item, that item has value, whether it's made of diamonds, binary code or beef jerky” (“5 Creepy Ways”). The point is well taken—what exactly is it that ascribes more intrinsic worth to a Gucci watch than to

Shadowmourne? Inside Gaia, users are clearly are willing to devote not only real time, but also real money, in order to gain items. Like many such environments, Gaia Online features two forms of currency—Gaia Gold, which is earned by playing the marketplace, completing repetitive tasks or becoming skilled at a particular leveled task, and Gaia Cash, which is bought with real money.

The presence of an in-game marketplace puts a whole new spin on *stuff and status*. Inside Gaia Online, for example, a player may have to work for 6 weeks to earn a guppy cap, but they can turn around and sell it to another player, eBay-style marketplace. The level of status that is gained from task rewards is thereby transferable to those who have no skill, but who DO have money. In the new pinball game, a score of over 1 million wins the player a bullseye t-shirt. Within one day of pinball's launch, for example, wearing bullseye t-shirts became an understood status symbol, and threads on the forums begged for tips on how to win one of the shirts. People with the money, on the other hand, bought them outright for 33 gold. The perceived status of the shirt was not affected by how you got it...unless a player was silly enough to say outright that they had bought it.

The systems of currency in Gaia and other online social environments raise the question of task rewards. All too often, educational environments see rewards in the form of grades. While this type of structure may work in a classroom setting, there is no reason not to embrace the rules of reward as set out in Gaia Online, where virtual rewards form a sliding scale based on effort. A bullseye t-shirt may seem like a phantom reward to digital immigrants, but that did not make it any less valuable to those who earned one. As Wong observes, "After all, people pay thousands of dollars for diamonds, even though diamonds do nothing but look pretty. A video game suit of armor looks pretty *and protects you from video game orcs*. In both cases you're

paying for an idea” (“5 Creepy Ways”). This sense of value in digital items takes place in part because one’s status online depends on having them. Gillen points out that inside “the physical world, the ultimate source of power, enabling such enforcement of rules, is physical power and the sovereignty of nation states. On the Internet, materiality and atoms have been replaced with signaling and electrons, wiring and cables” (215). Within the context of an environment like that of Gaia, power lies in the unreal.

In the traditional educational system, power lies largely in grades dispensed as both positive and negative reinforcement. How then do rewards translate online? Quest to Learn abandons the A/F grading scale, and students in the pilot program “don’t receive grades but rather achieve levels of expertise, denoted on their report cards as ‘pre-novice,’ ‘novice,’ ‘apprentice,’ ‘senior’ and ‘master’” (Corbett 2). At least in the first year, the sixth-graders in the pilot program were able to score on-level with their peers on standardized test scores. The idea of transforming grades into “skill levels” resonates very well with the role of self-directed exploration and inquiry in status-acquisition. Online, the knowledge of the group collective and the quest to gain possession of virtual items become far more powerful motivating factors than grades could ever be.

Changing the models of authority does not negate the need for some kind of formal structure, however. In most online communities, whether social or instructive, “Self-policing through group cooperation has been recognized by those who study the design and maintenance of vibrant [online] communities as the core requirement for community success” (Gillen 217). No matter how democratic our visions of online learning may be, there are obvious problems with allowing students to police their own environment. At elementary levels, such as *Poptropica*, it is dangerous to allow open access between students and other players, and young

students may fail to formulate fair rules and means of regulation. At postsecondary levels, the process of self-regulating is still distracting and carries the potential for bias. The need for an outside authority is challenged by studies who have “found that even the most successful community requires a system to monitor and sanctioned members’ behaviour. However, [...] this works best when the monitoring is carried out by the community members themselves rather than by an external authority” (Gillen 218). One possible answer to this dilemma is to include the instructors themselves not as outside authorities, but as represented community members with a virtual ‘body’ and presence in the game world.

In Gaia Online, the NPCs and admins have their own avatars, profile pages, and threads, and they regularly ‘walk’ through the playable sections of the game interacting with other players. This model could be a little more difficult to enable in an educational setting, in part because the teachers themselves would need to learn and play the game, much like GMs in *World of Warcraft*. Quest to Learn openly acknowledges this necessity, “has three full-time game designers supporting the work of the school’s 11 teachers — a ratio that reflects a trend more familiar to the business world, where designers and design-thinking have ascended to new and vogueish heights” (Corbett 3). Quest to Learn is somewhat a special case, however. It is designed and built to run as a small-scale experimental curriculum. Before simply throwing hundreds of teachers into a morass of unfamiliar game training, or integrating game designers randomly into classrooms, it is necessary to consider how and why an instructor should participate in self-guided learning matrices. While not meant in a specifically academic sense, Rheingold’s concept of the cybrarian is a good articulation of the teacher’s potential role in immersive online learning communities, which is that

a host is also a cybrarian. Good hosts nurture the community memory, pointing newcomers to archives, providing links to related conversations, past and present, hunting down resources to add to the collective pool of knowledge and teaching others to do it.

Well performed voluntary cybrarianship is contagious. (qtd in Gillen 218)

What better way to define the role of the educator online? To fully succeed in an environment like that of Gaia Online, it seems clear that a teacher would need to embrace the rules of the game as fully as the students do. He or she would participate in the game as less a player than as a virtual chaperone and custodian.

As Gaia Online demonstrates, a stable and unchanging model for *stuff and status* is hard to pin down. However, one element of appeal in Gaia Online reveals a larger common rule of educational market design: Iterative production is a common theme in this and other online collaborative sites. *Poptropica* began as a single island in late 2007, and over the next few years added new islands at the rate of about one every few months, each of which has their own unique storylines and content. This form of beta version no doubt offered Pearson the chance to collect initial information about the market, as well as to determine how children were using the game. Each successive island showed a clear progression towards a vision of the game as a learning tool. In other words, their developers opened their working beta version to the public. Gaia Online shows a very similar pattern. The grid map of the world is currently about 30% complete, but entire sections of the map, although un-navigable, are visible as uncharted territory. Iterative world-building on this scale adds interest to the game and facilitates a behind-the-scenes economy of scale for the developers.

In the foreseeable future, the expense of building a pervasive, popular, and continuously-developing immersive beta environment will probably require some kind of alliance with large

corporations. Successful working models such as Gaia Online suggest that virtual capitalism is one element of financial scalability. Gaia cash cards are now sold nationwide in large retail stores such as Target, and it is common to see passersby in the virtual towns sporting \$2.50 monthly collectibles and new Cash Shop items. No figures are available for Gaia's daily or monthly intake of real-time money, but the potential for real-life profit in virtual dollars is extraordinary. In July of 2009, an analysis of Linden Labs, the company behind Second Life, estimated the company's worth at "at somewhere between \$658 million and 700 million" (Wauters para. 1). Funneling even a fraction of that kind of money into an educational site would make for an unprecedented coup in terms of sustainability. While the prospect of marketing to teens and young adult students gives most educators pause, it is patently false to view academia as entirely distinct from economic interests and obligations.

In my own experience working for a large educational publisher, I have often been surprised by what a profitable business educational publishing is. The political battles waged over these multimillion-dollar educational accounts are necessarily fraught with financial motivations. If the end goal of my work is to create an eLearning platform that is not merely an interesting experiment, but rather functions as a popular mass-market component, the question of marketing becomes not why, but how: At the post-secondary level, college students are largely viewed as adult consumers who can make their own decisions in a virtual environment. At the elementary and secondary level, advertising is much more problematic. Gaia Online embraces advertising quite freely, but it is admittedly not an academic site and not tied to scholastics in any way. *Poptropica* experimented briefly with banner ads in between scenes, discontinued the practice for a time, and now seems to completely embrace advertising, with side ad panels, in-game billboards, and other features.

The tentative approach towards advertising in K-12 environments is understandable, given that even non-educational sites have faced public censure over advertising. In December of 2007, the *New York Times* reported that the popular children's virtual site Webkinz had began running ads for movies directed at children. Almost immediately, an advocacy group named the Campaign for a Commercial-Free Childhood publicly called for the ads to be removed. The CCFC director, Susan Linn, told the *Times* that "It's disappointing that the site is choosing to maximize revenue at the expense of children" (qtd in Story 8). While Webkinz followed the same light, tongue-in-cheek advertising format as in Gaia Online, which offered brand name bee outfits that characters could wear as a funny perk, the reaction against the ads was immediate and relatively severe. In the core user base, for example, "Parents, many of whom also play on the site after their children go to bed, began to notice the ads right away. A blog, www.WebkinzMom.com, put up an angry post in October, and dozens of other people posted comments in agreement" (Story 8). Banner advertising and overt ties to commercial products seem to be too vexed by marketing issues to use freely in pre-teen markets.

So what is to be done then about the reality of a business model? It's easy to imagine a dynamic, user-driven online world in which undergraduate students become digital learner-citizens engaging directly with course topics—but in reality, the business models of successful sites such as *Poptropica* and Gaia Online provide an important commercial model that academic gaming platforms cannot afford to ignore. The problem is that these sites themselves are so new that advertising spending is hard to secure even if it is sought out. As Shields pointed out in 2007,

everyone is experimenting with business models. There.com currently relies on four different revenue streams, according to Richardson: sales of virtual goods, advertising,

membership upgrades and real-world e-commerce (like concert tickets). Disney recently made more of Toontown free to users, but Club Penguin has a monthly membership fee. The new Pirates Online has both free and paid elements. Nickelodeon's Nicktropolis is entirely free, but advertising is just getting started. Meanwhile, Cartoon Network's current stab at a casual virtual world/game, MiniMatch, is free—but the company isn't sure what the model will be for next year's big-budget FusionFall. (para. 18)

One potential revenue source for a post-secondary academic virtual world is subscription-based learning, like the one *Poptropica* is toying with. If class materials are contained online, students would most likely be able to pay a lab fee similar to the current cost of a textbook. Yet even on a large-scale rollout plan, the cost of class enrollment would need to be supplemented by additional revenue streams in order to support the cost of hosting and development. The impasse we arrive at is how to scale the model to solve this issue.

Perhaps the best solution lies in creating and sustaining widespread appeal. If we conceive of an undergraduate learning environment as a hybrid of social networking sites, entertainment venues, and educational classrooms, the vision becomes more of a networked virtual life, one in which students and teachers can move freely not just for coursework, but for entertainment and socialization. I propose that this may in fact be the only scalable way to support such a site—to start from the germ of an idea that is not solely academic, but also meant to attract and keep users as active ‘citizens.’ There are few better models for this kind of approach than Gaia Online. As a case study, Gaia informs our understandings of what it means to succeed at that most elusive of marketing goals—attracting and keeping a user base that is willing to invest huge amounts of time and money in an entirely virtual society.

In the two years that have passed since my first analysis of *Poptropica* and Gaia Online, Quest to Learn has emerged as one of the most theoretically-similar classroom applications. On the surface, at least, the game puts into play many of the key lessons learned from Gaia and *Poptropica*. It addresses Robinson's lament about the lack of creativity in modern classrooms, in which he points out that "Every education system on earth has the same hierarchy of subjects. [...] At the top are mathematics and languages, then the humanities, and the bottom are the arts" ("Schools Kill"). In contrast, Quest to Learn incorporates many different curricula inside its game plan. There is a kind of mashup of different classes,

like Codeworlds—a hybrid of math and English class—where the quests blend skills from different subject areas. Students have been called upon to balance the budget and brainstorm business ideas for an imaginary community called Creepytown, for example, and to design architectural blueprints for a village of bumbling little creatures called the Troggles. (Corbett 2).

The interdisciplinary and playful nature of Quest to Learn unseats Robinson's claims about the hierarchies of education, at least inside its pilot classrooms. Katie Salen, one of the game designers of Quest to Learn, describes the motivating factor behind QL quite neatly. Salen says of the traditional curricula in American classrooms that it is "weird," and that "there's been this assumption that school is the only place that learning is happening" (qtd in Corbett 3). It is about time that we as educators start to look outside those walls and consider the implications of stuff, status, and play in a Gaia or *Poptropica*.

CHAPTER 4: THE EDUCATIONAL MODEL

While industry models proliferate, there are still few concrete examples of an immersive learning environment that has been both planned and built by academic theorists. The most probable cause for this lack of application is tied to a combination of funding and opportunity. Unlike traditional face-to-face lesson plans, even those that integrate progressive classroom technologies like Twitter and Facebook, a truly immersive digital environment is both difficult and expensive to build. Creating an immersive gameworld takes a team of immensely skilled (and highly paid) game designers, programmers, and instructional designers, on top of the pedagogical expertise. To put into play a successful framework for social networking in multi-user games also requires a user base of hundreds, if not thousands of students. This kind of scale is hard to tackle from a solely academic standpoint.

There are exceptions to this rule. One of the cornerstone attempts at academic worldbuilding is *Quest Atlantis*. Built and developed at Indiana University, *Quest Atlantis* is a successful and intriguing multi-user interactive educational environment designed for students ages 9-16. The program offers a working template for 3-D online teaching projects and “combines strategies used in the commercial gaming environment with lessons from educational research on learning and motivation. It allows users to travel to virtual places to perform educational activities (known as Quests), talk with other users and mentors, and build virtual personae” (“Quest Atlantis: Research” para. 1). The *Quest Atlantis* site is made up of 11 different virtual worlds composed of three-dimensional landscapes, in which fictional characters interact with students and directly address them. Within these worlds, students undertake ‘quests’ for information that involve a hybrid mix of online work, real-time ethnographic observation, and

library studies. Today, *Quest Atlantis* is a pervasive multi-user environment that has taught science, language arts, and social studies to more than 20,000 students on five continents (“About QA” para. 2).

Quest Atlantis is one of the few multi-user eLearning virtual environments that targets students as young as 9. At the same time its simulations as seen through the lens of a fantasy world—either imaginary or historical—are incredibly sophisticated. *QA*'s 2010 framework is on par with the vision of eLearning as seen by Alan Kay, who writes that the computer may “bring about a new kind of Renaissance by going beyond static representations to dynamic simulation. What kind of a thinker would you become if you grew up with an active simulator connected...to all the points of view of the ages represented so they could be dynamically tried out and compared?” (“User Interface: A Personal View” 193). Far from asking students to be passive and receptive, *Quest Atlantis* draws them into a dynamic world in which they are fully involved as both interpellators and actors. Such a performative concept also extends the electrated theories of Gregory Ulmer by allowing the student to undertake a literal journey across the meta-space of the Internet.

The key to making this journey work lies partly in the power of narrative. As Michael Allen points out in his *Super Mario Brothers* analogy, narrative structure serves as a self-perpetuating motivational context for tasks that would seem tedious in a classroom setting. Although the graphic-rich technical elements of 3-D gaming are relevant—even vital—to learner motivation, they are not the cornerstone to success in an eLearning application. In keeping with this position, James Gee posits that the power of video games lies in “their ability to create whole worlds and invite players to take on various identities within them” (*Video Games* 139). World-building creates a quite real virtual society in which students have a stake. For this reason my

analysis of *Quest Atlantis* must start with a close look at how narrative functions as a pedagogical tool in the virtual world of Atlantis, as well as how the game's academic developers conceived of its fantasy framework.

The role of the imaginary world in *QA* is vital to any understanding of the in-game experience. For one thing, the many worlds and possible player-paths in *Quest Atlantis* are evidently mosaic in structure, and this format is what enables the learner-driven participatory experience. As McLuhan writes, the mosaic form is at heart participational, "for the mosaic form means, not a 'detached point of view,' but participation in process" (*Understanding Media* 210). The multi-storied structure of *Quest Atlantis* creates a virtual environment in which immersive participation is itself the process. If the user does not "travel" through the game interface, nothing happens. It is the gamers' own conscious actions that create both their avatar personae and the mosaic segments that form their narrative. At the same time, the presence of adult teacher-moderators retains the aspect of the academic Panopticon in the virtual world. The student may be allowed to create their own paths, engage in synchronous chat, and, interact independently, but if they transgress by beating up another student's avatar, flaming, or hacking, they can be censored or even banned from the game. The space of *QA* and similar first-person games therefore forms a kind of power triangle between the game designers (the men and women who are iteratively designing and coding the virtual world), the game moderators (the arbiters of social and educational rules, and sometimes the teachers themselves), and the gamers themselves (students piecing together a mosaic experience within the given visual and behavioral limitations of the game-world). In this sense, *Quest Atlantis* follows an authoritative structure very similar to that of many successful mass-market games.

At first glance, the narrative of *Quest Atlantis* is relatively simple—the game is introduced with a complex and coherent narrative backstory that reads much like a fantasy novel: Maq rebuilt the Arch and planted it in the soil, and it was beautiful...but something was missing. The Arch had created a new caretaker called OTAK. OTAK did not yet understand what was happening, and he was afraid. Though Maq could no longer speak to the Arch, he found that as people began to come to share their stories, they earned lumins, and those lumins helped the Arch, and OTAK, to grow a little stronger. Today, Maq searches for Questers to come to New Atlantis to help produce lumins and help the Arch, and OTAK, learn and grow. Will you be the one to help make OTAK and the Arch whole and strong again? (“Legend” para. 3-4)

The role of imagination in this game is pivotal to its success, and *QA*’s imagistic worldbuilding bears much similarity to the look and feel of a traditional video game (see Appendix B for more details). Each of the worlds in *Quest Atlantis* contains complex and fully populated villages with quest chains. These worlds are vastly different from one another. For example, the recently-launched “Ingolstadt: Plague Unit,” was developed with the goal of “converting a classic piece of literature, like Mary Shelley’s *Frankenstein*, into a transformational play space” (“Plague World” para. 2). It is quite probably the first *QA* world to have a literary setting.

The narrative thereby becomes largely a means of teaching through a blend of science fiction, fantasy, and history. The world of Ingolstadt, for example, has architecture from the late 1700s, as well as stately NPCs in top hats. Students literally join the game as they enter the world through a “letter from mom” asking for help, and including “a letter she just received from Doctor Frank himself, whose writing further establishes the Quester as the protagonist with an important role” (“Plague World” para. 4). This letter—while it exists inside the game—is also

designed to link back into the real-world existence of the student/Quester. As the game's author points out, "The goal here was that these [two letters] would be shared in the context of the classroom before the child even entered the 3D world" ("Plague World" para. 1). The designers have made a very real effort to connect the fantasy world, through which the avatars move, back into the students' geographic and spatial concrete realities.

Fantasy is a big part of the narrative connection. One thing that many successful commercial games share—a backstory of a fictional and wholly fantastic world—is more than adequately illustrated in *QA*. The vision of travelers from another world, seeking to light an arch, is something straight out of a fantasy novel. Adding to the complexity of this question, as the game developed, the fantasy context for the game has lost some of its initial cohesion. New literary or realistic worlds like Ingolstadt and Ander City seem to be a departure from the continuity of the fantasy narrative. To fully investigate the question of how fantasy motivates exploration would require a detailed examination of the role of the alien in human imagination and engagement—a level approaching Baudrillard's hyper-reality of simulations. Instead I want to focus on the more prosaic matter of 'play' within a virtual world. *Quest Atlantis* is set up to be just alien enough to intrigue a young player. A snapshot showing the pastoral setting of the traditional Atlantean village includes mountains that are not too different from the American Rockies, but the buildings in the foreground are decidedly non-Western, with their castle-like turrets and sweeping round architecture. In contrast, the actual gameplay interface is quite often a low-complexity natural setting with little or no alien elements. If it were not for the remembered knowledge of the fantasy narrative, there is sometimes little to indicate that the setting is not that of a traditional reality-based game.

The interface itself presents another opportunity to analyze the role of graphic framing in

the user experience. On a surface level, research on dynamic interface design can tell us a lot about the layout of the *Quest Atlantis* gaming screen. Sutcliffe *et al.* write that “Windows or frames can be set to control which parts of an image are viewed. Larger window frames will be attended to before smaller areas” (381). *Quest Atlantis* uses this type of windowed interface, and it is not surprising that the largest frame on the screen is that of the imaginary game world, with the player’s avatar front and center. The second most prominent feature of the game interface is the play-record to the right of the screen, which includes the player’s level, points, awards, guild affiliation and assigned/completed quests. It is not quite clear what the role of guilds is in *Quest Atlantis*, but I do not believe they function in quite the same way as they do in a mass-market MMPORG, in which guild allegiance is player-directed and largely defense/power based.

Communication is a vital element of the interface. On the base of the screen the player’s chat space is visible, and although chat is only one of the communications platforms available in the *Quest Atlantis* environment, which include email, asynchronous bulletin boards, and blogs, preliminary research findings suggest that multimodal communications media are needed in online eLearning communities, especially for struggling readers. A study of English Language Learners in *QA* conducted in 2009 found that by using a blend of these communication methods “(e.g., chat, bulletin board, email) and 3D avatar interactions in virtual space, intercultural dyads negotiated and solved (co-quested) content-related problems in English” (Zheng, Young, Wagner, and Brewer 490). Indeed, the multimodal kinds of communication possible in an immersive game like *Quest Atlantis* can help teach not only communication, but also language. In the same sense that an immersive environment teaches the skill it is designed to, it also teaches modes of communication both literary and figurative. The “quest” goals built into the game help enhance the process of learning, since “from an ecological perspective, perception,

including language comprehension, is always intended to achieve a goal, which leads to some action providing a change in the information to be detected. Change is the essential element, the essence of a dynamic system” (Zheng, Young, Wagner, and Brewer 491). This ecological perspective includes the body, as well.

The avatar, in this view, becomes another means of communication, both with others and with the environment. Emerging work on “embodied cognition, as well as grounded cognition, points to a fundamental notion that thinking is directly tied to our bodies, whether real or virtual” (Zheng, Young, Wagner, and Brewer 491). As avatars move through the space of *Quest Atlantis*, they transform into an important non-verbal mode of knowledge acquisition through the figurative “body.” Gee clearly distinguishes verbal meaning from the first-person experience of gaming. While comparing online and lecture-based learning platforms, he writes that in the latter scenario “the students would have only general and/or verbal meanings, not embodied ones that they can customize to and for different situations of actual practice” (Gee *Video Games* 86). His use of the term ‘embodied’ is important here. As players in the world of *QA*, students interact with fictional ‘people’ by taking the form of the self-constructed game figure, or avatar. What is more, the paradigm of *stuff and status* is purposefully worked into the blueprint. As Barab *et al.* stated in 2005, at the time of the game’s inception, “By completing quests, the child earns points and gains status in the virtual environment. Over time [they] can gain virtual world privileges, such as walking through objects and flying” (“Making Learning Fun” 96). Students can customize their avatar with hair and skin tone, ethnicity, clothing, and other aspects.

The role of the avatar has developed much as the world has. For example, in one 2006 quest called the Cell Unit, the learner was locked into a fairly rigid linear progression in which there was little interaction with others, and few game rules. Cell Unit was composed of almost

entirely traditional academic content, and Barab and the other *Quest Atlantis* designers concluded that this type of interaction “potentially prevents the learner from engaging their virtual self, represented by their avatar and screen name, or from developing empathy with a system” (Barab, Warren, and Ingram-Goble 15). Because the user experience in the 2006 Cell Unit was the same for each player, there was little possible personal investment in either the character or the metanarrative. The gameworld did not react to student changes either, and the study concluded that the lack of a “narrative to cohere the learner’s experience leaves them with no means of immersion within the space or appreciation for how the complex systems of cells function. Similarly, nothing in the Cell Unit causes the environment to react to the actions of players/learners”(Barab, Warren, and Ingram-Goble 15). Simply translating academic content into an online avatar-based environment has little motivational effect. It has little transformative effect, either, as documented by classroom observations in which it appeared “almost as if the teacher was simply using the Quest Atlantis technology to have students complete and then review worksheets” (Barab, Warren, and Ingram-Goble 8). This kind of model forms the “technology for technology’s sake fallacy, in which technology itself is seen as a kind of novel or intrinsically different strategy for teaching content. Seen through this lens, Cell Unit is little different from a face-to-face classroom.

The developers of *Quest Atlantis* were almost surely aware of this fact, even in 2006. What was happening in those early years was most likely a form of experimentation, and of trying out different modes of instruction to see which ones worked best. This supposition is supported by the presence of another 2006 quest called Anytown, one which the developers purposefully hold up for comparison against Cell Unit. Within Anytown, the students “take on the role of a professional journalist as they uncover evidentiary clues, interview complex,

evolving characters, and solve game-like mysteries as part of their writing practices across content areas” (Barab, Warren, and Ingram-Goble 12). Inside this narrative framework, students could choose their own route through the game, as the characters within Anytown reacted “in response to the actions of players and those of other characters in the 3-D space” (Barab, Warren, and Ingram-Goble 15). Barab and the other developers specify that the less prescriptive quests, such as Anytown, were designed to encourage student involvement with other game characters and in turn to enhance students’ own identification with their avatars. As they put it, “it was not our intention to just have children walk around an aesthetically fun environment, but to design the space in a way that at the same time one is having fun they are engaging in deep learning” (Barab, Warren, and Ingram-Goble 16). The fusion of ‘fun’ and ‘learning,’ unsurprisingly, proved to be the more successful model. The modern quests of 2010 follow a model more closely indicated by Anytown.

It is perhaps for this reason that the creators of *Quest Atlantis* did not initially present the environment as a teaching curriculum, but even back in 2004 described it as sitting “at the intersection of education, entertainment, and our social commitments, creating many tensions as we work to balance these features to produce a metagame without guns that supports academic learning, individual development, and social transformation (“Making Learning Fun” 102). The metaphor of the intersection echoes Ulmer’s evocation of the Popcycle, and this vision of game as social matrix further differentiates it from traditional classroom materials. As Ulmer puts it, “the structure of Entertainment narrative provides an allegorical map for becoming an agent, which explains why the project to make a wide image is performed as learning how to consult on a public policy question” (*Internet Invention* 126). It would be difficult to see a textbook—or even a traditional classroom—as a true intersection of entertainment, allegory, and public policy,

yet the interactive game interface of *Quest Atlantis* places learning within exactly this kind of context. It is possible to further draw comparisons between the *QA* world and Ulmer's EmerAgency, in order to better investigate the possible applications of *QA* to theories of game-based education.

Like Ulmer's EmerAgency, *Quest Atlantis* takes an integrative rather than prescriptive approach to the learning environment. Sasha Barab's *QA* research blog notes that "participation in QA entails a personal and shared engagement with that narrative, as kids are asked to contribute information and ideas based on real-world experience to the activists of Atlantis" (para. 4). Many MUVES provide a structured world in which the player can create his or her own narrative based on movement through the fictional landscape. For example, two players standing in the center of a city in *World of Warcraft* can have vastly different game experiences based on where they choose to go, who they choose to fight, and who they choose to make alliances with. It is unclear to what degree the *Quest Atlantis* developers are actually able to incorporate those user ideas, but the narrative is at least partly user-driven. Barab lists one of the project's highest goals as the "rewriting the narrative of schools as something that involves content and stories that are personally engaging" ("Research Blog" para. 6). The question of who exactly writes this revisionist master narrative is perhaps the most interesting one. Is it truly student-driven? If so, then *Quest Atlantis* is very close to the incarnation of a Level IV game.

One way in which *QA* seems to be traditionally authoritative is the degree to which it takes seriously the question of moral and philosophical direction. Most first-person-player educational games must naturally avoid transgression in the realm of basic ethical issues such as nonviolence and ethnic diversity, but *QA* takes the process a step further. The game is openly structured around seven basal social commitments: compassionate wisdom, creative expression,

environmental awareness, personal agency, healthy communities, social responsibility, and diversity affirmation. These seven categories alone could be the subject of a close analysis in terms of how academic audiences project their own assumed social structures and agendas. They are paired with descriptions that range from general observations to specific directives. The social responsibility commitment page within *Quest Atlantis* “speaks” for the student user by stating, “If I see injustice, if I see unkindness, if I see neglect or hate, it is not enough to voice these things within myself. It is my right and responsibility as a human being, to become involved, and to sound my concern so that others will hear me” (“Social Responsibility” para. 1). The attempt to mandate an ethical persona that extends beyond game play is a fairly unusual element in primary eLearning applications. In one sense, this element fits with *QA*’s desire to transcend the framework of immediate task-based learning and instead shape global citizens. The phrasing of the definitions themselves is also a conscious decision on the part of the developers. As they put it, “any decision to conceptualize the commitments with greater clarity must be made carefully because, as they become more instructive, they also risk becoming more radical, or more conservative, or more or less spiritual, and so forth” (Barab *et al.* “Our Designs” 271). It is possible, however, that the social commitments still force a normative, Western, and highly academic model for “citizenship” onto the game.

Another interesting aspect of the commitments is how each of the general ethical directives of each social commitment is personified. Each of the seven categories of social commitment is associated with a color, images, and an avatar. For instance, “creative expression” is personified by Council Member Calron, a blond Anglo-Saxon male with slightly unkempt hair. This category of social commitment is also signified by the color orange, which the page informs the viewer is “associated with enthusiasm, fascination, stimulation, and

creativity. Orange combines the energy of red and the happiness of yellow. This color is known to increase oxygen supply to the brain and to stimulate mental activity” (“Creative Expression” para. 2). The diversity affirmation strand is the only one to have no individual council member avatar, but rather lists the members as “all,” with no character images. While the practical question of putting a face to diversity is probably a factor in this decision, diversity is by default the only shared social commitment category. The implication is that the remaining six categories—such as healthy communities and creative expression—are less universal and more controlled. I sincerely doubt that the game’s creators consciously meant anything of the sort, but the inclusion of characters as ‘speakers’ for only 6 commitments does result in this strange contrast.

This attention to the development of the student’s social commitments may also affect the narrative infrastructure of *Quest Atlantis*. While many mass-market games incorporate competitive play and leveling, educational games have traditionally done neither, and *QA* in fact does not provide for levels or competition. Barab *et al.* explain their reasoning for this strategy by stating that “Although providing a rich opportunity for reflexivity, leveling can unfortunately lead to competitive participation, usually focuses on gaining power for killing, and often connects to the activity narrative only idiosyncratically” (“Our Designs” 271). While on the surface this claim is unarguably true—mass market video games usually focus on PvP and PvE competition in which violent acts can be committed for the sake of entertainment, often completely outside the main narrative—I would argue that by avoiding this issue *QA* runs the risk of losing one of the elements that makes video games so appealing in the first place. While I agree that shooting people in a classroom game could be a little extreme, to remove all aspects of

competitive gameplay effectively neuters the medium. In fact, other educational games like *Dimension U* stand in direct contrast to this mandate.

Academics and commercial game designers often differ on this key point. Commercial gamer developers would most likely see the emphasis on character development over violence as a pointless and pretentious stance. By taking away the competitive edge, the *QA* designers have distanced themselves from the world of gaming, and I would argue, from the inherent appeal Gee characterizes in his work. From Gee's perspective, the larger narrative context is not always the most powerful motivating factor, and in fact he says of video games that "I am so involved at the level of action—worrying about where I am, what's to be found there, what am I doing, what good or bad things might happen to me, what needs doing right now—that the larger storyline often seems to float somewhat vaguely above me" (*Video Games* 83). The tension described here is drawn largely from the potential that something 'bad' might suddenly happen. By making *QA* largely noncompetitive and non-violent its developers have removed the sense of game tension. They are themselves conscious of this potential gap in appeal, and to supplement the entertainment value of the game they created a form of educational "character-leveling," in which students must progress by lighting the shards of crystal in the Atlantis gate:

Every Quest and most Quest Atlantis activities relate to these commitments, and depending on which commitments a particular student prioritizes, he or she will 'luminare' (level) on different commitments and develop requisite functionalities; thereby, evolving a unique character based on her personal interests. ("Our Designs" Barab *et al.* 272)

In a world in which many children are used to the direct game competition, however, leveling in order to 'luminare' one's 'social responsibility' crystal does not seem to be highly compelling.

Even games rated “E” by the Entertainment Software Rating Board are approved for ages 6 and over can contain “minimal cartoon, fantasy, or mild violence and/or infrequent use of mild language” (“Game Ratings” para. 4). As a token example, the E-rated *Aegis Wing* requires players to battle aliens using “four super weapons, including the Hades Beam (kills everything in its path), the Gordon Burst (EMP pulse that kills all bullets and short circuits enemies), [and] the Arcus Missile (heat-seeking missiles)” (“Aegis Wing” para. 6). Killing everything in your path is hardly a beacon of socially-responsible brotherly love. Even assuming parents are strict about enforcing game rating levels, the beginning *Quest Atlantis* player (age 9) could have more than three years of experience in blowing things up with the Hades Beam and Arcus Missile.

I do not by any means intend to suggest that educational game developers pander to a desire for violence in children. Rather, I believe that the academic definition of nonviolent engagement may at times be out of touch with the lived experiences of young gamers. Activating crystals to symbolize one’s understanding of social commitment sounds like something most 9-year-old children would not choose to do without an outside directive from a parent or teacher. To be fair, the game’s developers were very clear that they saw the quests as “framed by the types of issues and interests that the children themselves have expressed” (Barab *et al.* “Our Designs” 274). If this aspect of the game is truly learner-directed, then there are two options to consider. It is possible that I am misreading the needs and desires of young learners, and that the nonviolent and character-driven aspect of the game is indeed appealing to them. The more likely option, however, would be that *QA* developers are (albeit benevolently) superimposing their own issues and interests on the game. If the latter is true, then the game cannot be said to be truly learner-driven as a true Level IV.

Whether or not *Quest Atlantis* is truly learner-driven, it is obviously not intended for

solely self-directed learning. Beyond the question of the learner, then, there is also the question of the teacher. In describing their short-term goals for the program, the designers at Indiana University state that they support teachers through “a teacher manual, with professional development training, with novels and comics for their students, with continual monitoring of chat, with time-relevant blog entries, and with technology support” (“Join QA” para. 1). This focus on educator support is an absolutely vital component of any successful eLearning environment. Without a proper infrastructure for the teacher, as well as the learner, a game runs the risk of losing its pedagogical merits and becoming simply an arena for free play. This does not necessarily figure the teacher in a restrictive light, however. *Quest Atlantis*’s developers acknowledge the importance of self-direction, saying that

The teachers we worked with were at first wary of allowing students to engage in any off-task behaviors in a virtual world. However, they soon realized that the time students spend exploring the narrative, interacting with characters, and even engaging with content not connected to assigned academic content is an important part of the overall effect of the medium. (“Why Educators Should Care” 80)

Although Gee argues that learning takes place inside any game regardless of direction, it makes sense that a game intended to teach discrete skill sets and specific academic standards must have some measure of instructor control and reporting. *Quest Atlantis* does not make clear what the teacher interface is like in the game, perhaps in part because it is not very revisionist. The only examples of the teacher interface available to outside users look very much like the Houghton Mifflin Harcourt ePlanner, the Pearson ePlanner, or any other mainstream competition model. Based on this model, the teacher need not be a participant in the gameplay or even an observer beyond the standard reporting features.

It would be problematic for any eLearning platform to require overworked teachers to play games along with their students all day, just for the fun of it, but the differentiation between the two kinds of experience deserves more critical consideration. Barab *et al.* address teacher agency obliquely through their discussion of implementation:

In terms of Quest Atlantis, a core challenge has been how we best support teachers in successfully implementing Quest Atlantis, especially given its inquiry-based activities and its commitment to rich narratives and rich participation as opposed to mere content acquisition [...] Employing Sfard's (1998) distinction between the acquisition and participation metaphors of knowledge, whereas much of K-12 schools ascribe, at least in terms of the actual classroom practices, to an acquisition model, Quest Atlantis is based on a participation metaphor. ("Our Designs" 274-75)

I want to call attention here to the participation metaphor. By this rule, the teacher's role need not remain the same as in a traditional classroom, except in terms of the medium and assignment type he or she is using. In early stages of development, the site's creators

found it necessary that the Quest Atlantis virtual environment be adaptable and made "local" by future users. This was done through, for example, the Teacher Toolkit, which allows teachers to dynamically change the virtual environment to benefit their own students, such as by creating local affiliations, selecting affiliation-sponsored Quests, introducing their own Quests, creating local guilds, and reviewing student work in ways consistent with their extant classroom practices. (Barab *et al.* "Our Designs" 287-288)

The inclusion of the Teacher Toolkit does much to make *QA* a more interactive and personalized experience for the teacher. Teacher-content interaction must necessarily be an integral part of eLearning platforms, and as Garrison and Anderson point out, "the semantic network provides

opportunities for teachers to find, utilize, and in some cases create learning objects that are automatically updated by other content agents, by emerging data, and by other research results or environmental sensors” (45). *Quest Atlantis* allows for the find (search) and utilize (assign) classifications, as well as allowing for the creation of customized learning objects through the teacher-toolkit.

This level of teacher development and engagement is critical to the success of a digital learning environment. As critic Todd Oppenheimer puts it, “for decades the dominant trend in education has been to push teachers into technology regardless of their level of interest in these tools” (308). While Oppenheimer is not speaking specifically of immersive learning environments, his point is applicable to all technology-based tools. If the teacher is not *interested* in the experience, then it becomes little more than another pointless mechanism that is likely to be used badly or not at all. Past a small group of elite, tech-savvy teachers it has yet to be determined whether *Quest Atlantis* is compelling enough for unskilled or digital immigrant teachers. Katherine Hayles writes that if students are to write effectively in digital media, “we need to develop modes of critical attention responsive to the full range of semiotic components that can be used as signifying elements in electronic work, including animation, sound, graphics, screen design, and navigational functionalities. In effect, we must learn to speak digital” (371). In other words, it is hard to expect teachers to ‘speak’ digital if they are able to remain at a safe distance. Barab *et al* conceive of *QA* as a transformative experience analogous to Hayles’ digital speech. They write that “Not only the student but also the teacher undergoes critical transformation [and...] the teacher, too, can be redefined as not a purveyor of wisdom but a facilitator of understanding, a vehicle for imagination” (“Our Designs” 295). As facilitators

within the digital realm, they expect that teachers must by default speak at least basic digital language.

However, I would argue that *Quest Atlantis* does not entirely deliver on the concept of participatory digital citizenship for educators. If teachers were able to join the game, say, by playing as council members, the binary divide between learner-player and controlling outside authority would be broken down further. Within the context of the game, council members ('played' by *QA* developers) already produce blog articles in journals, and it does not seem like a far stretch to incorporate this kind of functionality for the teacher as well. Rather than simply assigning or creating quests, the teacher could become an even more active participant in the game. Garrison and Anderson have said that the greatest benefit of online learning is "its capacity to support the social construction of new knowledge and its validation and enhancement by participants spread out around the world and across temporal space" (122). The construction workers who build these new knowledge sets must be as comfortable in the virtual world as their students.

Even while teachers remain distant facilitators, though, the paradigm of community learning present in *QA* does significantly change the traditional lecture-based classroom structure. Barab *et al.* state that

Designing curricula that change classroom practices (e.g., from teacher controlled to student controlled, from didactic lectures to inquiry-based, from individual to shared knowledge, from knowledge acquisition to engaged participation) has rich potential for advancing a critical agenda. However, we suggest that design-based researchers might take even better note of how their work supports or confronts existing practices. ("Our Designs" 265)

Indeed, *QA* confronts existing K-6 educational publishing practices in that it does not always walk the careful political line of many games designed for young users. The social responsibility commitment includes an image of the concentration camp at Dachau, and the creative expression commitment states that “although it is vandalism, graffiti can be visually expressive.” Because they are working in a medium that lends itself to visual representations of abstract concepts, the designers may actually have more liberty than a traditional text-based learning environment. Although print textbooks include visual elements as well, their representation is far more linear and didactic. It would be unheard of for an HMH elementary Social Studies text to include blatant ethical mandates, along with an avatar, representative color, and selection of images for each. In the medium of online gaming, these boundaries can be redrawn.

How then do the designers of *Quest Atlantis* seek to change the purpose of learning? In 2007, Barab *et al.* claimed that “At the curriculum level, [transformation] involves enlisting socially critical narratives to situate the curriculum such that it is about learning more than disciplinary content but also recognizing and even acting on potentially disruptive agendas” (“Our Designs” 265). One way in which they do this is to set up the game world to seamlessly interface with so-called ‘real world’ activities, and many of the quests themselves involve outside research with little to no gaming elements. At first glance, the hybrid internal/external structure of *QA* seems almost backward in that it requires students to exit the game to complete assignments and tasks. Surely a complex MUVE environment could be advanced enough to be self-contained? Barab *et al.* explain that this was a conscious design decision made in part because “in contrast to traditional role-playing games, one’s game identity and activity depend on the child exiting the virtual environment to respond to Quests in the physical world. In this way, *Quest Atlantis* is not simply a ‘computer game’ but incorporates ‘real-world’ activities as

well” (“Our Designs” 269). In fact, the game is also designed with a requirement of physical *QA* centers at which students must be registered. The idea of online learning as a detached non-geographically located learner experience is de-centered and re-conceptualized as an integrated curriculum.

Quest Atlantis must deal with challenges more practical than those of curriculum transformation, as well. For one thing, there are serious developmental implications caused by its own success. Over the course of more than six years, Indiana University’s developers have continually returned to the game, building and rebuilding its components through the framework of a successful beta version. However, one of the pitfalls of beta development is the patchwork structure that can develop as new areas are built, often using newer and more vibrant technologies. In mid 2010, the design department of *Quest Atlantis* described the rationale behind one design update by saying:

In the case of Math World, we were faced with an environment that had been built as the narrative evolved, resulting in dead-end streets, buildings that no longer served any purpose, and a general feeling that Ander City was more a collection of structures placed in proximity to each other, rather than an actual city. (matth para. 3)

To solve the problem, the *QA* designers reviewed the narrative, structure, and programming existing in Ander City. This type of tripartite approach takes into account not only the narrative context, but the geographic ‘structure’ and technical limitations of the existing virtual world. The end result not only reorganized the city, relocating the quest hub “park” to the center of town, but updated the graphics and design. For example, one concern was that the newer, splashier game not become too graphics-heavy to run on older public school computers. To help address this issue, the developers say simply that they “had to take our best shot at making Math World as

resource efficient as possible. While I'll spare you the more mundane technical details of 'vision limiters' and polygon counts, you may find it interesting to note how many of the buildings are simply flat fronts" (matth para. 9).

The implications of this process are far-reaching. At its simplest level, a successful beta program cannot just continue to build new locations on top of the pre-existing ones. There will be a need for overhaul and revision, not only for pedagogical reasons (the structure of the city), but also for technical reasons. There are also natural trickle-down effects on users, help features, and in-progress quests. In a live gameworld, what will happen to a student already in the middle of a quest when an update pushes live? The teacher guidelines will almost certainly need to be updated, as well as any quest instructions or Ander City blogs using screenshots of the old environment. In addition, developers working with hugely varying degrees of hardware cannot push the envelope too far. As matth's post points out, the truly immersive, explorable 3-D town would be not only costly to build, but literally impossible to use for many public schools. The end result is that "we've create [sic] a world where walls only extend halfway around the house, roofs are floating in midair, and trees 'on the horizon' are actually 1/10th scale models placed 20 feet away" (para. 10). This illusory and limited worldview runs contrary to the idea that a virtual world should allow free and unlimited exploration outside the game narrative.

I do not mean to suggest that *Quest Atlantis* must represent the ideal articulation of virtual multi-player learning. Regardless of what I may see as its failings (or even its points of contention), it is a bold and admirable step in the direction of immersive learning. The knowledge we gain from *QA*'s successes, failures, and mysteries can help develop newer, more flexible forms of theory and practice. As the game's main designers state:

Instead of simply building an artifact to help individuals accomplish a particular task, or to meet a specific standard, the focus of critical design work is to develop sociotechnical structures that facilitate individuals in critiquing and improving themselves and the societies in which they function, and then we use our understanding of participation with these structures to advance theory. (“Our Designs” Barab *et al* 264)

The role of theory thereby becomes secondary to that of quite literal kinesthetic experience, and the designers seeks to build theory out of *QA* rather than the other way around. This point of view argues against the idea of first building a theory, then applying it to a learning platform. *Quest Atlantis* provides the vital lesson that theorists and academics—as well as students—can only learn through doing. It is the metaphorical processes of building and rebuilding Ander City that will form these new articulations of digital education.

CHAPTER 5: THE EVOLUTIONARY MODEL

The intriguing powerhouse that is today's *Dimension U* began with a small web-based proposal back in 2005, when this dissertation was in its infancy. The game wasn't on anybody's radar at the time, and in fact at that point existed as little more than an intriguing idea. The initial website—a miniscule description of a proposed video game for algebra students, designed by a brand new startup named Tabula Digita—caught my attention in part because it was given theoretical backing by James Gee. When I first found it, the website featured little more than an odd, futuristic-looking space man, and the (very short) video demo promised a game with the theme of mutation, along with a soundtrack and voiceover straight out of *Resident Evil*. The trailer also promised that the game would teach algebra through the first-person player interface, with the slogan “Learn Math, or Die Trying.” I was hooked.

As soon as the *Dimenxian* CD was released, I ordered a demo copy and played the game, analyzing it from the point of view of both student and educator. My review of *Dimenxian*, as of spring of 2007, is reproduced below, with few changes beyond the cosmetic level. I have left it largely intact because it is now itself important as a framework for evolutionary study. While I originally intended to use *Dimenxian* as a case study on the birth of a mass-market educational game, it now serves as a point on a continuum, an alarming and exciting illustration of exactly how rapidly the market is moving. Less than four years later, the company—and the game—have themselves mutated into something both different and unexpected. This 2007 case study, bracketed by an understanding of where the company is now in 2010, serves as a fascinating model for incremental beta development.

* * *

Spring, 2007. Review of first-release Dimenxian CD

The convergence point of mass-market gaming and academic devices is most evident in games such as *Dimenxian*, a first-person-player game developed in 2006 by Tabula Digita. On the surface, this game follows a structure very similar to that of a standard commercial video game. *Dimenxian*'s creators describe it as a "3-dimensional immersive education learning experience that focuses on Algebra I... [and in which] graphics, sound, and animation compare positively to features found in modern-day video games" (Tabula Digita 3). The critical reception to *Dimenxian*'s launch was extremely positive. The game won the 22nd annual *Macworld* 2006 Editors' Choice Award, joining a short list of winners including popular entertainment and information programs such as Google Earth and YouTube. The editors of *Macworld* commented that although "education software is often as appealing to kids as a trip to the principal's office...[Tabula Digita has] come up with a novel alternative" (Cohen). This comment is noteworthy in that it acknowledges the 'elephant in the room' that most publishers are currently ignoring—the problem of appeal in current educational technologies. In October of 2006, the Federation of American Scientists, "which usually advises the government on terrorism, nuclear, biological, and chemical weapons...called for a bigger investment from the federal government, private industry, and schools to explore the promise of video games in schools" (Toppo). Critical reception to the game indicates that *Dimenxian* may be able to fulfill this promise where other programs have failed.

Dimenxian's construct principles draw from theorists such as James Gee, who was cited multiple times in their 2006 white paper, and the company tried out multiple early partnerships

including one with *The Princeton Review* (Trager para. 7). In this sense, the program is indebted to both academic theory and corporate process. The emergence of games such as *Dimenxian* represents an important step towards what the International Telecommunications Union termed the “Internet of Things.” In its 2005 report, the ITU predicted the Internet’s three-phase transformation: “From an academic network for the chosen few, it became a mass-market, consumer-oriented network. Now it is set to become fully pervasive, interactive, and intelligent” (13). *Dimenxian* is still rooted firmly in the second phase, that of the consumer-oriented network, it forms a link between the pop-culture element of gaming and the traditional academic network. The ITU states that the development of the Internet of Things “will occur within a new ecosystem that will be driven by a number of key players [...] Indeed, technology and markets cannot exist independently from the over-arching principles of a social and ethical system” (13). Among the players in the ITU’s imagined ecosystem are Local Users (*Dimenxian* players), Producers and Suppliers (Tabula Digita), Consumer Advocacy Groups, R&D Organizations, and Governments. The important point to underscore here is that games like *Dimenxian* move learning outside the ivory tower and make transparent the growing interrelationship between capitalist developers, government agencies, and the educational system itself.

Dimenxian does an excellent job of embedding a skill within a narrative context. As James Gee states, “humans are quite poor at learning from lots of overt information given to them outside the sorts of contexts in which this information can be used” (Gee *Video Games* 115). The question of theory pales somewhat next to the question of practicality, however. Before analyzing the complicated interplay of social and commercial interstices in the game, it is first necessary to understand on a very basic level how the product looks and feels to the student. Educational software might be perfectly aligned to pedagogical theory, but if it is not appealing

to the player the pedagogy becomes pointless. As a whole, *Dimenxian* passes the test of visual appeal with flying colors. In mission 1, students must plot a course across an island in order to recover data from weather stations. The static principles of x and y axes thereby become elements of navigation across 3-D terrain. Interestingly, *Dimenxian* comes down hard on the immersion side of the educational debate over telling versus immersion. The game does not tell you how to plot an x, y coordinate when you enter, instead putting you in the center of the jungle and telling you to find the coordinate. It does not prompt you with help until you are some 25 points off course on the other side of the island either, although at that point it does proffer suggestions about the mathematical mistakes you may have made.

In one sense, *Dimenxian* still conforms to the traditional classroom cultural model of learning as the mastery of fact sets. Mainstream commercial video games tend to stress “non-linear movement—exploring all around without necessarily moving toward one’s ultimate goal and the mastery defined by that goal—as well as linear movement...greatly deepened, sometimes transformed, by the horizontal movement” (Gee *Video Games* 164). In the world of *Dimenxian*’s mission 1 level, the player can run in circles finding weather stations other than the one he or she is directed at, find and shoot small toothy invertebrates, and explore multiple other game elements. Still, the player cannot interact with any of these elements in any real way. In this sense this game, like other educational games, lacks the multiplicity and rhizomatic nonlinear movement that is one of the most compelling features of a mass-market video game. The popularity of very difficult video games such as *Doom* or *Halo* depends partly on the way they “stress multiple solutions judged by a variety of different standards, some of which are internal to the game...and some of which are set by the player” (Gee *Video Games* 164). This sense of player agency is lost in the learning objectives of most mainstream educational games.

When we built Harcourt School Publishers' *Online Adventures*, our team was focused mainly on creating content review that happened to live within an entertaining narrative. I doubt the developers of mass-market video games have ever had to think of what "content" they want to "review," and why.

I am not by any means suggesting that video games do not test knowledge and build skills. In fact, many multi-player games have even become social networks in which players can test out different identities and social alliances within the virtual universe. As Gee points out, "kids have turned video games into...specialist domains that internally in terms of social practices bewilder adults" (*Video Games* 38). The challenge educational game designers face is how to understand and re-create the lifeworld domains of video games while giving them a direct pedagogical purpose. In one sense, Gee would argue that video games are already pedagogical in content, but to encapsulate direct skill-based knowledge in a video game—the quantifiable, testable skill sets required by NCLB—is a very different matter.

Dimenxian sets out to model the narrative structure of commercial video games through a sci-fi military plot device. This plot structure is bare-bones, and the player is told only that his or her job is to "contain a 'bio-digital virus' that is causing life forms to mutate on a remote island. The virus has transformed life on the island into 'bio-mutes,' including a deadly species called Sentinels, which are bent on your destruction" (Cohen para. 3). The game thereby refigures the Frankenstein archetype in the style of *Doom* or *Resident Evil*, in which a human scientist (the father of the mysterious Darienne, the game's only other human character), has created a bio-digital cyborg virus that threatens all of humanity. Players must enter the game as its main character, Kepler Harris, the "commander of the special-ops team" which has been sent in "to

help Darienne Clay, daughter of the great Dr. Robert Clay, contain a bio-digital virus” (Cohen para. 2). The archetype of the warrior-hero is also filled.

On a theoretical plane, it is interesting to note that the storyframe of *Dimenxian* is rooted in the context of mutation—their grainy and artistic 2006 introductory video flashes the term ‘mutating’ while cells divide and Kep’s face in the background is covered in patterns of corruptive green in a manner eerily similar to the way moss and lichen overtake an abandoned building (“Trailer”). The metaphor of Haraway’s cyborg immediately comes to mind—Oncomouse solving algebraic equations to enter a biotechnology superdome. Humanity and the supposedly civilized world, which exist outside the borders of the game’s universe, are threatened by the fusion of man and machine. At the same time the trailer’s ending slogan, “Learn Math or Die Trying,” ties the game firmly back into a pedagogical purpose (“Trailer”).

Dimenxian’s graphics are themselves a strange hybrid of fantasy and science. The island landscape is dotted with large red toadstools and toothy land anemones. Fronds of palm trees and other tropical species obscure the pathways of the island itself, and the landscape is a strange mix of austere cliffs, beaches, and flat green meadows. In the midst of this tropical/fantastic universe the player encounters numerous militaristic devices, such as a jetpack and a tank, the latter of which is used to fire electromagnetic gel as “you’re netting bio-mutes and measuring them in one activity” (Cohen para. 6). The island landscape is itself a cyborg fusion.

Perhaps the most evidently mass-market gaming element in *Dimenxian* is its approach to competition. Most educational games focus on positive reinforcement in which the learner is rewarded for his/her knowledge but never threatened. In contrast, *Dimenxian* uses the more sophisticated reward/punishment competition matrix of commercial video games. Learners can compete with one another online for high scores and can even “die” in the game if their skills are

not up to par. It is worth noting here that despite the game's slogan, "learn math or die trying," the game still shies away from real-time death. When the player is shot multiple times by the sentinels, the game says that it is "temporarily deactivating bio-suit" and "regenerating," the language of which is purposefully far removed from death or destruction. The imagery of Kep crouched on the ground also has little in common with the spurting arterial gouts of blood that can accompany game death in commercial games.

In addition to the violence of game "death," *Dimenxian* has a clear competitive component as well. For example, the multiplayer functionality claims that it will allow students to play against one another in direct competition. Using mechanics similar to CTF, "the gameplay has players racing to pick objects at the right coordinates, or selecting the right equations in a series of objects. Tabula plans on running a tournament during Macworld involving students from San Francisco-area schools to demonstrate the game in action" (Park para. 3). The idea of a competitive tournament decenters the collaborative aspects of classroom learning and places the focus squarely on winning—beating the other students to a goal. Although theorists such as Ulmer and Barab focus more on the role of cooperation and community in online learning, I would argue that the competitive learning framework in *Dimenxian* actually offers incentive for learning.

However, these incentives could still be improved. One element notably absent in educational games such as *Dimenxian* is secrets. Like the hidden fatality codes that generate entire unofficial weblogs, sites, and even books, or the hidden Easter Egg interactives in *World of Warcraft*, traditional video games offer an opportunity for extra-narrative development on the part of curious or experienced players. James Gee states that "good games encourage active thinking," and to do so the player must be able to deviate from a linear script (*Video Games* 46).

To the best of my knowledge *Dimenxian* follows a straight linear development path. Its fictional world is populated by legions of strange beasts and mechanicals, but shooting and data-loading them brings no response. They seem to be mere wallpaper elements, at least on the first level of the mission packs, and the game's element of surprise and curiosity is drastically diminished. It is true that the player can take unexpected actions such as walking into the sea, but this gained me no entertainment value past a five-minute walk through a sterile underwater landscape, shooting bubbles at the sand.

Another weakness in *Dimenxian*'s game structure is its strict character formation. The player must be Keplar Harris, "commander of the special-ops team," and he or she has no other options. While there are certainly many successful commercial games with a set lead character (not always male, such as Lara Croft in *Tomb Raider*), the performative element of gaming is not best-relayed through single-character construction. In many commercial games such as *Arcanum* and *EverQuest*, you construct your own character before you start playing, complete with self-selected race and gender. Gee posits that the creation of three identities form this convergence: the virtual, real, and projective (*Video Games* 52). The virtual identity is "one's identity as a virtual character in the virtual world of *Arcanum*," a role analogous to Kep's in *Dimenxian* (Gee *Video Games* 54). Gee's second identity is a "real-world identity; namely my own identity as James Paul Gee, a nonvirtual person playing a computer game" (*Video Games* 55). Again, the second identity is necessarily represented in *Dimenxian* through the player's non-virtual self.

However, it is the third identity that *Dimenxian* arguably fails to fully account for, and is in fact a focal point of experiential gaming. The third identity as defined Gee is "a projective identity, playing on two senses of the word 'project,' meaning 'to project one's values and desires onto the virtual character'...and 'seeing the virtual character as one's own project in the

making, a creature who I imbue” (*Video Games* 55). In *Dimenxian*, the character is preset by the game developer so any projection can be only accidental. Except in terms of mastery levels, game players also cannot be said to imbue Kep with a trajectory. There is no chance for the student to project “an identity as to who the characters ought to be and what the trajectory of his or her acts in the virtual world ought, at the end of the day, to look like” (Gee *Video Games* 58). While some might argue that this process is irrelevant to learning algebra, I would counter that it has everything to do with gaming. If, as McLuhan claims, the medium truly is the message, then the pedagogical and narrative threads cannot and should not be viewed as separate.

Why are apparently irrelevant details such as character construction important in the context of an academic game? As Gee puts it, the different identities at play in a game “is at the root of active and critical learning in many other semiotic domains, including learning content actively and critically in school” (*Video Games* 59). Content may be memorized through a linear game interface, but to teach critical thinking and create lifelong learners is a different matter entirely. In an educational system that is seriously damaged—and the definitions of real-world learner identities along with it—Gee’s words ring true. If students “cannot or will not make bridges between one or more of their real-world identities and the virtual identity at stake in the classroom...or if teachers or others destroy or don’t help build such bridges—then, once again, learning is imperiled” (Gee *Video Games* 61). In other words, a game like *Dimenxian* could fail if it does not engage the learner through an integrated identification with the main character. The game’s creators deserve credit for their attention to pan-ethnic inclusion—Kep’s face is tan-toned with high cheekbones, a broad nose, and slightly angular brown eyes, and he could be almost any ethnicity on Earth except pure Anglo-Saxon. Still, who is left out through the present

identification with an adult, human, warrior male? It is a particularly interesting character choice considering the often-true stereotypes about female students, gaming, and mathematics.

I do not mean to suggest that *Dimenxian*'s creators purposely exclude Caucasian or female players. They are, after all, creating a commercial product, and some of the most successful video games around still provide the player with a single male identity. There is an implicit logic behind creating such a set identity—female players are seen as more flexible, and willing to play as both male or female characters, but male characters are not thought to be as accepting of playing as a girl. The social ramifications of this statement aside, there are of course exceptions to the rule. The blockbuster *Lara Croft: Tomb Raider* series has a strong female protagonist, but her appeal to male players is set in a very sexual context (witness the pinup posters of Lara Croft, wearing a cut-off shirt and hot pants and sporting anatomically-improbable DD breasts). As the female studio design director for Schell Games puts it, “We tend to make our females look like they're ready for sex right now” (Graner-Ray qtd. in Lee para. 2). Perhaps that is the problem faced by *Dimenxian*'s creators: In an educational game targeted to K-12 institutions, the design must take into account the complicated political dynamics of our educational system. Sex and violence may very well be familiar to young students who play mass-market video games, but both subjects are carefully monitored when it comes to scholastic materials. To have even a chance of acceptance in public schools, *Dimenxian*'s creators are forever barred from the possibility of designing a female character to attract through sex appeal.

Women are not entirely absent from the game, however. The *deus ex machina* who guides students and warns them of their math missteps (addressing Kep directly to inform him that he seems to have transposed the x and y axes) is a woman named Darienne Clay. She remains, however, a disembodied voice. Students cannot play *as* her, only *with* her. It is possible

that on some level she can be spoken to in person, but on all the levels I managed to beat she is simply a voice with a narrowly sketched-out backstory. As players learn from the game, Darienne is the daughter of “the great Dr. Robert Clay,” whose research led to the first bio-digital mutations in a laboratory. Moreover, she is responsible for assisting through the utilization of her father’s inventions, and “the data you collect and analyze is used by Darienne to figure out where her father’s research went wrong, by comparing it to his early research linking algebraic structures to natural organisms” (Cohen para. 3). It is tempting to analyze this backstory from the perspective of a feminist critic—her father is “Dr. Clay,” yet she is “Darienne,” and although she inherits the sins of her father it is the achievements of his research, not her own, that she depends on. At the same time, however, the most likely realistic reason for her secondary-character status is still the assumption that few boys will play as girls...unless those girls are half-dressed, and popping out of their clothing. The makers of *Dimenxian* made a wise choice from a market standpoint.

There is a third option in gaming beyond the male/female binary, which is self-selection from multiple character elements. It is tempting to wonder how it would change *Dimenxian* to let players build their own third category of persona as an elf, a dark-skinned woman, a gladiator, or a sentient animal. It is hard to predict what the effects would be, but Gee’s research seems to suggest that they could be profound. In *EverQuest*, for example, the player creates a persona from a

nearly endless combination of races, classes, skills, and abilities...[which] breaks down into 14 professions (Bard, Cleric, Druid, Enchanter, Magician, Monk, Necromancer, Paladin, Ranger, Rogue, Shadowknight, Shaman, Warrior, or Wizard) and 12 “races” composed of three human cultures, three cultures of elves, and so on. (*Video Games* 170)

Past the level of ethnicity and career path, players in *EverQuest* are also able choose their religion, intelligence level, and guild (player group) affiliation. The game even has “its own economic structures based on supply and demand [and] in some cases, players of games like *EverQuest* and *Diablo 2* have gone online to auction sites such as eBay and bought and sold virtual items” (Gee *Video Games* 171). As it is, *Dimenxian*’s financial backing and game framework could never support anything approaching this level of inherent economy or social order. To be fair to *Dimenxian*’s creators, educational games are not funded nearly as well as commercial games, and the programming necessary for a mutable range of character traits is daunting in terms of both time and money.

What other motivations underpin the structure and purpose of *Dimenxian*? One of the most obvious is the pervasive presence of standardized testing. The long-term pedagogical effects of NCLB are being felt throughout the American educational system. In an effort to save public schools that are churning out sub-par students, in part because of a huge mass of learners, red tape, and political issues, the U.S. government under President George W. Bush initiated “No Child Left Behind.” The 2001 NCLB system of learning focuses almost exclusively on a system of quantitative knowledge measurement designed to boost student and teacher accountability. Across the nation, children in grades 3-8 are drilled all year in preparation for standardized testing. While NCLB derives from good motives, the end result is to measure learning by the net worth of millions of ABCD scantron test results through “accountability systems [that] gather specific, objective data through tests aligned to standards and use that data to identify strengths and weaknesses in the system” (“The Facts”). In keeping with this change, the development of recent K-12 educational gaming necessarily follows the model of testable skills.

Dimenxian's division of earned points into academic and gameplay reflects the focus on quantified assessment, and throughout the games skills such as the plotting of x, y coordinates form the driving linear context. But what price does this strict point A → B structure have? As Gee points out, the problem in direct-instruction learning is that “children in these sorts of pedagogies are not learning to discover and test patterns for themselves (which still of course, requires the guidance of a good teacher). They are learning to store discrete facts and elements of knowledge, not deeper patterns” (*Video Games* 94). A game like *Dimenxian* does much not only to stimulate interest in the discrete facts, but to situate them in test patterns—if I run this way across the island I can track my progress not only on my grid, but also through the ley lines on the land. In this sense *Dimenxian* lives at an entirely different level from that of its predecessors. It fits solidly into my Level II of educational gaming.

Perhaps the very clear and well-written linear storyline is actually part of what keeps *Dimenxian* from actualizing the requirements of a Level III. One of the key facets of successful commercial games is their lack of concrete direction, so much so that “players [must] learn how to ‘read’ the physical environments they are in to gain clues about how to pass through them. The shapes and contours of the physical environment, and the objects lying around, come to guide the player...” (Gee *Video Games* 109). In contrast, the player as Kep is told to go to x33, y23, and along the way nothing they do can change that path. As long as the player is able to figure out where those points are on a grid coordinate, the process of getting there is reasonably mindless. Kep runs straight forward through low-lying vegetation, over the tops of the toothed anemones, and bounces harmlessly off small trees before scooting sideways around them to continue. No matter how hard I tried, I could find no interesting secrets outside the game path. Running into the water resulted in a surprising, fun run on the sandy bottom, with Kep's gun

creating small rising bubbles when fired...but there was nothing to do on the ocean floor, and nothing to attack me. Eventually I came back to the surface out of sheer boredom and continued on to the pre-set coordinate point.

Contrast this scenario with Gee's description of *American McGee's Alice*, a game in which the player plays as a kind of gothic Alice in Wonderland gone mad. Inside the game's landscape, you are

lost among rocks and wild streams. However, you can see far off at the top of the mountain a bit of a mansion. Furthermore, the environment contains some contours of rocks and hills that suggest ways up. And finally, shining on a few rocks ahead of you are red jewels that you have already learned will give you more health if you pick them up.

(Gee *Video Games* 109).

It is these elements of exploration and more metaphorical problem solving that are absent in *Dimenxian*, at least in the levels I played. Truly visionary scientists, artists, and thinkers in a certain sense navigate a real-world Wonderland of clues and fragments. Modern workplaces working in a digital world are increasingly looking for the investigative skills that video games require. For example, research on corporate culture points out "that in today's high-tech and fast-changing world, the most valuable knowledge a business has is the tacit knowledge its workers gain through continually working with others in a 'community of practice' that adapts to specific situations and changes 'on the ground' as they happen" (Gee *Video Games* 110). If the objective of education shifts from short-term quantifiables to the development of adaptable adult 'communities of practice,' then the focus of educational games moves beyond the x,y axes of *Dimenxian* and into the changeable virtual world of *EverQuest*.

While educational video games may one day reach the advanced level of a game such as *EverQuest* or *World of Warcraft*, the team at Tabula Digita deserves credit for a revolutionary step forward in educational gaming. As someone who works in the field of educational technology, I am well aware of the constraints faced by any gaming software trying to compete against mass-market video games. It is difficult to find exact figures for video game development budgets, but Kathy Schoback, group director of the CMP Game Group, estimates the average development and marketing cost for an internationally-distributed current-generation Mac/ PC game at about \$8 million, increasing to about \$26 million for next-gen AAA titles (Slides 6-7). I seriously doubt any educational game developer can command even a percentage of that kind of funding. Without serious corporate backing, the programmers at *Dimenxian* could not possibly be expected to create pervasive multiplayer worlds on the level of *Halo* or *World of Warcraft*.

Further complicating this issue is the fact that *Dimenxian* is designed to earn a profit. In fact, about a quarter of the homepage is devoted to an appeal to purchase the product. Although the game is developed with pedagogical use in mind, the capitalist motivation behind its creation and marketing has an undeniable effect on its use in the context of academia. As our capitalist system channels desire through economic realms, it necessarily links the learning process to the same economic patterns. Education outside the sphere of corporate profit is an illusion. In fact, I would argue that most, if not all, of the next generation of first-person player educational games will be produced by major corporations mainly concerned with return on investment. Theorists and research institutions will almost certainly play a role in that development process, as they have for *Dimenxian*, but the fact remains that because game development is prohibitively expensive, it is possible only within a corporate context. Within the rules of the capitalist model, the sales on such a game would need to be extremely high to justify its existence. The total

revenue from sales of an AAA title commercial game is estimated at around \$73 million (Schoback Slide 9). In order to bring in that kind of money, the \$30-a-sale *Dimenxian* would need to sell just under 2,500,000 copies.

Purists might argue that the economic motivations behind game development are problematic because they are likely to slant the pedagogical content. However, this kind of argument fails to take into account the fact that academic textbook publishing is already an equally corporate profit-driven industry. When a publisher writes and produces a history textbook, the politics of content is generated by its anticipated effect on sales. In a recent California state adoption, the multi-million state market drove the process of content creation to the point where several publishers were willing to alter their representation of polytheism in Hindu history based on a sectarian lawsuit. While scholars argued that these changes would “distort history and present a political view of Hinduism not generally accepted in India today,” the publishers made edits to meet the state’s requests (Manzo 22). Just as these educational texts are, the educational video games of the future will naturally be funded in part by private multinational corporations, and profit margins will drive content just as surely as they do in California’s textbooks. The exact effect the element of profit will have on future games is less clear. The first-person character of Kep Harris may very well be male in part to generate more sales. Future games could capitalize more on violence because of mass-market appeal, but they might also stick to a carefully non-bloody framework as *Dimenxian* does, in part so companies can profit from the extremely lucrative multi-million dollar state public school adoptions. Decisions on game content and context will be driven not only by pedagogy, but by funding. Profitability, which demands cutting-edge graphics, leads to yet another complication that will be faced by developers of eLearning games. When the editors at Macworld reviewed *Dimenxian*,

they noted that “graphics are quite good, although they’re a bit primitive compared with current state-of-the-art in first-person shooters,” but they also noted that the “hardware requirements seem to be a bit steeper than what most schools have at this moment” (Cohen para. 7). Even the relatively modest scope of *Dimenxian*’s graphics may be overreaching the mark for the available hardware in public schools.

In any case, the game’s developers certainly deserve the accolades they have received, and recognition of *Dimenxian*’s merits is likely to continue to grow. At the 2007 National Educational Computing Conference, Tabula Digita joined ISTE and Apple for the first ever National Multiplayer Education Game Tournament at NECC. Students there competed both individually and in teams in an exhibition-style tournament using *Dimenxian*. Obviously, this game has managed to harness at least some of the appeal power of the commercial gaming industry. Changes to standard methods of teaching and learning are only likely to accelerate in the future. The EDUCAUSE Evolving Technologies Committee sums up this change succinctly by saying, ‘will video games change higher education? Skeptics may ask, ‘Did television? Did radio?’ And the obvious answer for those technologies was no. We assert that video games are different. They are not a passive medium” (Hitch and Duncan 7). *Dimenxian* does much to fulfill the promise of this new interactive social medium.

* * *

Fall, 2010: Dimension U

Less than four years after I wrote it, my review of *Dimenxian* has become valuable mainly as a point on a roller-coaster continuum. As of Fall 2010, Tabula Digita’s *Dimenxian* has

morphed into an online multiplayer and real-time gaming system named *Dimension U*, which is nearly unrecognizable in theme, discipline, and graphical display. This process of evolution took place over the course of less than four years. In 2007, slightly after my initial review, Tabula launched *Dimension M*, its first multiplayer real-time game. Unlike the way they did in *Dimenxian*, players in *Dimension M* logged onto a virtual real-time and browser-based environment. There, they played against each other in games very similar to freeze-tag and rally races, solving multiple-choice questions to test their knowledge of math content aligned to NCTM standards. At the same time, Tabula began organizing an increasing number of real-time tournaments that brought students in large school districts together to play against each other, school-to-school and person-to-person. In December of 2007, New York City public schools hosted “the first-ever citywide Math video game tournament” for hundreds of students (“Got Game” para. 1). Students from all five boroughs of the city competed against each other in a live race for prizes, and the CD-based single-player game of *Dimenxian* became a thing of the past. Soon thereafter, in January of 2009, Tabula announced an unprecedented partnership with Pearson Education. Beginning in fall of 2009, the *Dimension M* game suite was customized, aligned to, and sold with the mathematics curricula in Pearson’s elementary and middle school textbooks (“Video Games in Schools” para. 1). Tabula had done what I had dreamed of; they had created a large-scale corporate/publishing partnership with one of the American Big Three. The innovative, out-of-the-box thinking of the small startup has secured backing from the deep pockets of a traditional educational publisher. From that point on, things picked up speed.

Today, funded in part by its partnership with Pearson, Tabula Digita has evolved into *Dimension U*. The 2010 marketing PDF available on the *Dimension U* website notes that the curriculum now covers grades 3-12, with “more than 400 skills covering math and now literacy”

(“Introducing” 1). Nor has this process of development resulted in a single finished product. *Dimension M* and *Dimension L*, both backed by Pearson, consistently add new features, such as what Tabula’s marketing brochure terms “Our favorite new mission yet, Velocity, where players race to the finish line on a virtual track” (“Introducing” 1). They have also been joined by the “coming attractions” of *Dimension H* for history, and *Dimension S* for science. While neither of the latter gameworlds are live at the time of this writing, *Dimension S* is home to a small side project, the League of Scientists. The League is an odd case, seemingly less an immersive VR environment than a playground for developers. It was first launched in 2009 as a separate website, and even now, as incorporated into *Dimension U*, it retains an altogether different look and feel. For one thing, its games are more linear and multiple-choice. Two-dimensional on-screen rats tiptoe down a tube in a race to a bit of cheese as the player answers multiple-choice questions. The student does not play as a character here either, although they do have a highly customizable and item-equippable avatar. However, the League of Scientists seems to have attracted very few players indeed. When I created an account in 2009, I encountered no other players online at the same time I was, and I would not be surprised to learn that the few players on the leaderboards (the same names from 2009-10) are internal employees. As a whole, the League of Scientists feels like a down-market version of Gaia Online or *Poptropica*—it doesn’t yet have a good grasp on its own identity and purpose.

Meanwhile, inside *Dimension U*, the storylines and user roles of the more central first-person player games have changed dramatically since *Dimenxian*. Although they retain some of the initial sense of the bizarre—the landscapes are distinctly alien in feel—the storyline of mutation and the man-eating plants are no more. Instead, there is a slightly futuristic, yet largely uninhabited landscape across which students leap, shoot, and interact with each other over giant

landing pads, subterranean tunnels and machines. *Dimension U* also adds a few other very fundamental features that were missing from *Dimenxian*. For one thing, there is a fully-integrated online Educator Portal with “improved formatting of on-screen and spreadsheet exports of reports,” as well as tracking for “home vs. school day play time” (“Introducing” 2). As a whole the Educator Portal incorporates functionality approaching that of a sophisticated LMS. This development is probably due to the fact that, as the game met with success in more national school districts, administrative functions and reporting became serious business. Through the educator portal, teachers and parents can view time on task, review student answers, and even assign and control gameplay and levels of difficulty. The Educator Portal fills the last remaining serious gap in *Dimenxian’s* setup, and the evolution from startup game to corporate powerhouse is complete.

Documenting this process of evolution, however, is not the same as understanding its implications. There are two main lessons to be learned from this evolutionary model. The first is that the speed of change in today’s educational gaming industry makes the market inherently unstable. Within the space of four years, Tabula Digita changed not only its platform, but also the entire organizing principle behind its business. In 2006, Tabula Digita was a startup company marketing a single-player, CD-based install product targeted mainly to Algebra students. Players entered a fictional universe in the set persona of a fictional persona and completed a set series of tasks. In its current 2010 state it is a real-time multiplayer environment. There, students from schools across the nation play their own customized avatars, interact in a world with its own infant currency and social rankings, and are free to explore multiple different disciplines at will. The entire paradigm has changed, to such a degree that my 2007 analysis does not even begin to accurately describe the company or its products.

The second, and possibly most important lesson, is simply this: in 2007, I predicted most of it. *Dimension M* and its more sophisticated descendent, *Dimension U*, have specifically and consciously addressed a startling number of the criticisms I had of 2007's *Dimenxian*. *Dimension U* is now pervasive and interactive, allowing students in different school districts to compete with each other from home or school. Its player-movement patterns have become for the most part non-linear, directed more by the interactions of different player groups across a virtual landscape than by set POU interactions. In capture the flag, for example, the game can take an almost infinite number of directions based on the strategy and actions of the opposing team.

Nor is the player in today's *Dimension U* confined to playing as the character of Kep Harris. In this new reality, players can create their own race, gender, and appearance. League of Scientists even lets students become literally unhuman through their avatars (see fig 3). The newborn avatar economy allows players to earn and spend coins that equip their avatar with increasingly fun and wacky items. In League of Scientists, these items include the Animal Track ID Kit and Cheese of Distraction. It is not yet clear what the items offered in the *Dimension M* and *Dimension L* Rewards Store will be. The 2010 marketing flyer of late 2010 promises that these new features will include a "Rewards Store where students can collect new avatar assets and Power-Ups," and that the earned currency used in that store will be called "DimensionU Tokens" ("Introducing" 1).

While these aspects would seem to move *Dimenxian* squarely into Level III of my online hierarchy, two key blockers remain that trouble *Dimension U's* rank in my four-part category of online learning environments. The first is the necessarily limited series of paths within the game. There is no sense of leveling or of narrative progression. Many of the most successful mass-market games, from *World of Warcraft* to *Farmville*, utilize a sophisticated sliding scale for

leveling. It is easy to level at first, and beginning players are encouraged by their immediate progress, while the more skilled players at higher levels must play much longer and accomplish much more difficult tasks to advance even a single level. In *Dimenxian*, students were able to gain very basic achievements such as the ability to use a jetpack, as well as advancing from one mission to the next. In *Dimension U*, there is no real evidence of this kind of progression; in that sense, the game can even be said to have taken a step back from the world of *Dimenxian*. While the student playing as Kep Harris had to apply their mathematical knowledge to solve “virtual world” problems, such as how to find the four weather stations on the island, the player in *Dimension M* is largely solving math equations as multiple-choice problems meant to advance them along a course. The mathematics are peripheral to the game’s objective—to beat the opposing real-life team to the finish line, or to gain the most points in the game.

This cognitive disconnect raises some serious questions about knowledge transfer. While the ability to correctly answer and solve multiple-choice questions and simple equations is undoubtedly valuable for NCLB’s standardized testing, it is unclear how *Dimension M* trains its students for real-world math application. As Hancock *et al.* point out, “Negative transfer develops from at least two related reasons: (1) system design changes and (2) a mismatch between a training system and the actual task” (50). Past the world of the primary and secondary school system, students will rarely be faced with the task of solving unrelated equations to win a game. Seen through this lens, the tasks in *Dimenxian* actually did a better job of integrating mathematics into a real-life context—people can navigate using mathematics, much like students do to find the weather stations. It is unclear whether *Dimension M* encourages this kind of positive transfer, in which “an individual *correctly* applies knowledge, skills, and abilities learned in one environment (e.g., in simulation) to a different setting” (Hancock *et al.* 50). To

further complicate the issue, the game is far too new to allow for any kind of hard data on positive transfer. *Dimension U* has only existed for a few months, and the members of its target audience—American schoolchildren at the secondary level—are still in school, encountering few opportunities for real-life application outside of standardized tests.

This may be the reason that Tabula’s past studies have focused most closely on how and where the game affects student performance on standardized test scores. A 2008 study by UCF reported that “over an 18-week period, students playing the educational video games [*Dimension M*] demonstrated higher gains on district benchmark exams than students not playing the games” (Riedel para. 2). It is not hard to admit that this focus on benchmark testing makes sense in the era of NCLB. Teachers and students are focused on the here and now—the ability to get a high score on that all-important benchmark exam. Still, there is something unsettling about this focus. Once of the most brilliant things about *Dimension M* was that it was experiential. For the most part, the math was clothed in narrative tasks that lent themselves quite easily to knowledge transfer. The task of netting and measuring bio-mutes is not too far different from the work done by a research biologist in the field. Plotting weather station locations bears a striking resemblance to the process of determining grid point coordinates on a military map. In *Dimension U*, this aspect of *simulation* has been lost.

The second blocker that troubles *Dimension U*’s position between Levels II and IV is the lack of self-construction. To the best of my knowledge, students in the game still have no ability to construct their own environments or extra-narrative development within the game universe. While they have unrestricted freedom to wander inside the (somewhat limited) world of *Dimension M*, there is no reward for this kind of wandering, and there are no Easter eggs to find off the established paths. The game economy is limited to earned-currency and “store”

exchanges, and there is as yet no possibility for the development of a more sophisticated auction house or marketplace, as we see in *Second Life*, *Gaia Online*, and *World of Warcraft*. The level of sophistication and self-direction inherent in a simulated economy is missing. On the other hand, educators might argue that the self-perpetuating economy of a world like *Second Life* distracts from the point—students play *Dimension M* to learn math, not to learn how to price and sell striped scarves and giant chickens in an imaginary marketplace.

On a more serious note, however, the re-envisioned *Dimension U* does little to help educators and theorists challenge and rethink their own understandings of the interstices between digital and real-world existence. The elements of cognitive dissonance in *Dimenxian*—the alien landscape, the threats of violence and mutation—have entirely vanished. The cyborg biodigital virus no longer threatens our understandings of the distinction between “living” and “digital,” and the landscape of *Dimension U* has been diminished and made normative. Even when *Dimension M* was first launched, back in 2007, the avatars and worldscape had become slightly more mainstream than that of *Dimenxian*. Instead of playing with the edgy and theory-driven themes of online representation and mutation, Tabula slowly began to conform to a humanoid and vaguely stylish teen image. The avatars on the cover of its 2010 marketing brochure are cute human adolescents wearing slightly futuristic half-helmets and gloves (“Introducing”). They are a far cry from the dark and battered spacesuit of Kep Harris. The background world of *Dimension L* is represented as less an alien world than a pink Arizona with a shopping mall in the background; *Dimension H* shows Egypt’s pyramids against a modern city.

Still, I acknowledge that credit must be given where it is due—for a first-person player educational game to have been accepted in such a widespread K-12 market is disruptive in the extreme. As Tabula’s Etuk puts it, “In the past it has been generally accepted that there were

three legs to the learning stool – instruction, practice, application [...] we, at Tabula Digita, add engagement as a new and critical leg of that stool” (qtd. in Dobson). In this sense, Tabula itself is a mutation; a successful bio-digital virus of its own that is transforming the educational horizon. The normative trend in *Dimension U* is also an understandable side effect of success. The pressures of big corporate sponsorship, combined with marketing concerns for large public school districts, will put normative pressure on any K-12 brand. At this point in time, the college market may be most open to disruptive innovation.

Despite these pressures, it is still possible that the next iterations of *Dimension U* may address the very aspects that I am holding up for criticism. If there is one thing the evolution of this analysis has taught me, it is that it is not difficult to think one step ahead of the game (no pun intended). This process becomes far trickier when trying to think three or four steps ahead of the game. In a world of beta development as agile and unpredictable as Tabula’s, it is indeed necessary for developers and theorists to think several steps ahead of the curve—after all, the future will be behind us sooner than we think. Pinning down the different ways that new platforms and technologies could change the product requires some revisionist thinking. For example, how can *Dimension U* translate onto mobile devices? Can GPS-based “check-in” apps like Foursquare’s be used to help support knowledge transfer through real-time movement? The “Internet of Things” has become a phrase widely used since the 2005 ITU report, with companies as powerful as Google joining the movement as late as 2010 (Baumann 12). In its latest iteration, the fully pervasive and interactive intelligent network is seen as one which connects electronics such as household items, phones, cars and potentially homes, schools, and games like *Dimension U*.

Despite its pitfalls and backslides, *Dimension U* stands as the closest working example of the ideal. Its agile beta development cycle, strategic alignment with big corporate and technical partnerships (as of 2010, Dell and Intel are partners as well), and its pervasive understanding of itself as that visionary fourth leg of the stool all combine to make it the metaphorical city on the hill. It is easy to criticize, but for all the theorizing that Gee, Ulmer, and others have done, *Dimension U* has put theory into practice on an impressively grand scale. The *Dimension U* of 2010 is a curious mashup of gaming, K-12 education, and Big Publishing. It serves as simultaneously a stepping stone, a cautionary tale, and a model for our educational future.

CHAPTER 6: THE COMMUNITY MODEL

This chapter moves to the online Florida folk art gallery of Folkvine.org, a collaborative effort started by Craig Saper and Kristin Congdon of the University of Central Florida. Supported by grants and sponsorships from groups including the Florida Humanities Council, the Texts and Technology doctoral program, and the Cultural Heritage Alliance, Folkvine established itself as an innovative and experimental web project. Before delving into the intricacies of this site, however, it is first important to note that Folkvine operates on a fundamentally different set of rules than the other case studies in this dissertation. For one thing, it is a non-profit venture funded in turn by non-profit public organizations. It was not intended to function as a financially-viable business concern. Even beyond the issue of profit, however, Folkvine differs from my other case studies. The site is a living artisanal space designed for a casual audience, and there is no quantifiable learning goal or group achievement associated with it. For this reason there are no assessments, score tracking features, or strict TOS control in Folkvine.

The absence of benchmark assessment in Folkvine makes sense—although the site has been used in K-12 schools, it was conceived and developed according to an explorative set of rules and priorities that exclude any concerns about marketability or standardized testing. In the world of Folkvine, cognitive learning occurs in an esoteric and experiential way when users create their own versions of the pieces the folk artists make, crafting their own vejigante mask, or pair of clown shoes. Even the questions on the gameboards inside the game room are clearly lighthearted, and not meant to seriously “test” quantifiable learning. Instead, Folkvine’s ties to education play out through two somewhat broad channels. The first category of learning in

Folkvine relates to the site's positioning as a "meta" teaching tool that served as GTA credit for some of the students working on it. The second and more pervasive link to education is the manner in which the site serves as an online museum, designed to appeal to several groups of users. Craig Saper includes among those "the general public, looking for greater access to often inaccessible folk life and art," as well as "folklorists and ethnographers" ("Virtual Tourism" 209). In short, Folkvine operates within a sphere in which design and function is dictated largely by idealistic academic goals.

The core team working on Folkvine grew and changed several times over the years the site was in production, which stretched from 2003-2007. Over these years, there were three distinct "waves" of development, each of which dealt with a different set of folk artists. The original project directors—Craig Saper and Kristin Congdon—were UCF faculty from the English and Philosophy departments, and they were later joined by Natalie Underberg, from UCF's department of Digital Media, Elayne Zorn, a folklorist from UCF's Anthropology department. Zorn's work was instrumental in extending the concept of virtual folk narratives into other cultures and languages, particularly the bilingual format of Peruvine (a separate site located in UCF's Digital Ethnography Lab). While Peruvine does not exhibit the same directives or focus as Folkvine did, its features—such as interactive rooms with slideshows, guides, and video—are clearly both informed by and inspired by the work Zorn did on the project team.

Together, this interdisciplinary leadership group worked alongside a student and faculty team consisting of editors, folklorists, web designers, researchers, videographers, and technical coordinators. While every large-scale web development effort naturally incorporates working groups of this nature, the Folkvine team was different in one fundamentally important way: all of its participants began with a deep-rooted investment in the theoretical grounding of the site. This

theoretical perspective was important not only from the perspective of interdisciplinary collaboration, but also in the interpretation of Folkvine's subject matter. Although Folkvine incorporates elements of gaming, it is at heart designed to serve as a serious ethnographic platform for community interaction as it translates the lived experiences, art, and histories of a small group of folk artists. The purposeful inclusion of the self-reflective voice in Folkvine also brings to light the role of the producer in the site. Just as the authors of printed texts do, the content writers and Flash developers are quite literally creating the "text" of the online work. Saper openly discusses this aspect of Folkvine when he notes that "the implicit argument of the experiment, that design is a crucial aspect of the message, and that message is the sensibility of the artists and traditions explored, may not always succeed in the particular web designs discussed" ("Visceral Scholarship" 7). Design and the designers, from both the literal html coding and figurative strategic perspectives, become important elements of the folk art as seen on the Internet.

Concepts of design were further complicated by the fact that the folk artists profiled in Folkvine quite commonly entered the project without any prior clear and persistent web presence that the team could use as a model. For example, for the 2003-2004 project scope, the team selected Ginger LaVoie, "Diamond" Jim Parker, the Scotts, and Ruby Williams as their featured artists. The process of translation for Ruby Williams, whose folk art was sold at a simple vegetable stand in rural Bealsville, posed replication questions for the development team. *How best to translate the lived experience of visiting a rural vegetable stand that sells folk art?* Their solution was to approach the Folkvine design process from a non-traditional perspective. As Saper points out, the user of Folkvine should "note the entrance to Williams' site via a vegetable stand (rather than the typical flat design of scholarly presentations). The stand is not

symmetrical, and it has a composite image of her paintings on boards included with her *vegetable stand*” (“Visceral Scholarship” 10). When the user mouses over the site, they are directed to choose a painting through which to enter the online museum. In this way, the situational context for Williams’ art is translated through the visual and interactive elements of web design.

Throughout this process, the core team was always careful to qualify that they wanted to “place art on the web in a manner that adequately represents select artists and their communities” (Congdon para. 1). As with Williams’ vegetable stand, the development team’s cornerstone goal was to create a truthful representation not only of the art, but also the artist and their community. Moreover, Congdon and Saper hoped to translate that sense of physical community into a playful and interactive online space while retaining a sense of serious academic scholarship. As the artists moved from vocationally marginalized positions into the more central and publicly-accessible educational platform of Folkvine, they would be preserved in a kind of living museum accessible by Internet users across the nation and potentially the world. In Saper’s words, “we began to realize that although the world could not beat a path to these artists, we could open a window to their worlds” (“Visceral Scholarship” 9). Capturing not only the art, but also the contextual world, took some deeper thought about how digital medias can be used as tools for the representation and distortion of reality.

What are the deeper implications of translating such a traditionally marginalized subject—the lived experience of folk art communities—into the massive worldwide community of the Internet? From the beginning, the role of digital technologies in modern society was a key source of interest to the Folkvine project team. Congdon states that “the proliferation of technology has been primarily capitalistic in its goals instead of educational. Technology has

become so central to our lives that it is often thought of as our salvation. Jagodzinski, like many other scholars, believes that technology has replaced God in our contemporary world” (para. 8). This understanding of technology as theocracy, central to a 21st-century American belief system, fundamentally informs the design of Folkvine. The site embraces the progressive, openly playing with ways to create digital representations of tactile (and sometimes three-dimensional) art. Folkvine's developers openly state that “it became our quest to see if technology can be used in such a way that the spirituality and building of a community's values might be encouraged rather than destroyed through the use of technology” (Congdon para. 8). It is for this reason that Folkvine serves as an ideal case study for the translation of the arts into digital narrative.

Situational context and physical metaphor are very important factors in the artistic metaphor for Folkvine. The artists—while the heart and soul of Folkvine—are not the first thing a visitor to the site sees. As a point of entry, the designers chose a familiar metaphor grounded in time and place; the folksy Florida roadside store. The common context of a country store positions the site in the troubled interregnum between the traditional past and progressive digital present. The folksy roadside store itself also helps ground the user's experience in the context of the familiar. This reification of a common physical scene resembles Baudrillard's first phase of the image, which “is the reflection of a profound reality,” rather than the distant context of simulacra (6). The visitor must metaphysically “enter” what looks like a real building through its front door, reflecting the structural rules in a physical building. On the symbolic level, this method of entry also posits Folkvine as a self-contained and discrete online space. This form of representation is an accurate metaphor for the site's structure. Although the succeeding artists' pages do link out to other websites, Folkvine still feels more like a controlled space in which virtual exploration is encouraged, but limited. The metaphor of the building serves to define

Folkvine as a virtual entity, and it is less a rhizome than a discrete structure. This store may have neighbors, but they're quite definitely outside the walls.

In addition to the metaphor of the roadside store, there are myriad other representations of the familiar in the site's opening screens. For example, users can open the newspaper box in front of the store and pull out a copy of the *Folkvine Post*, an online newsletter written by the site's programmers and academic collaborators, and formatted to look like a small-town newspaper (it's labeled as a "free" copy, reflecting back to the freedom of online information). As a whole, the newspaper is in keeping with a simulation of the folksy American hometown newspaper, with headlines, photographs, and friendly feature articles written by the site's developers. At the same time, it is one of several elements in this site that are clearly meant to go below the surface to explore the theoretical background and history through academic language. The country store metaphor is retained even in this more serious context.

While the store serves as the overarching metaphor for the online community that Folkvine creates, its interior is removed from the real by at least one further step on Baudrillard's progression of simulacra. On a shelf inside the store, some of the members of Folkvine's developer team are featured as a row of bobblehead dolls. These dolls, built by lead videographer and artistic director Lynn Tomlinson, are crafted to caricature the members of the core team. Chantale Fontaine, Lisa Roney, Natalie Underberg, Kristin Congdon, Craig Saper, and Danny Coeyman—a group which represents the voices of the project directors, web designers, writers, folklorists, and art directors—bobble cheerfully as the user mouses over them. When clicked to 'activate,' each doll speaks a greeting in the recorded voice of the actual person. Saper's analysis of these bobbleheads notes that they are designed to "poke fun at the self-

important seriousness of scholarly commentary (even as we continued to produce it)” (“Visceral Scholarship” 15). The exaggerated silliness of the bobbleheads is consciously meant to lampoon.

Through this lens of playful self-representation, the real starts to blur further, and the site echoes Baudrillard’s claim that simulation is “rather a question of substituting signs of the real for the real itself; that is, an operation to deter every real process by its operational double, a metastable, programmatic, perfect descriptive machine which provides all the signs of the real and short-circuits all its vicissitudes” (2). The bobblehead dolls are neither fictional nor real, nor are they immediately mutable. They speak in the past/ recorded voices of the people they are meant to represent, recorded somewhere around the year 2005. They also bear a distant physical resemblance to the real people as they looked at that point in space and time, one of whom passed away in 2007. As hair grays and people change, the bobbleheads on the shelf of Folkvine remain eternally young and eternally loquacious. Any deeper analysis of community within the context of Folkvine would almost certainly need to take into account how this kind of substitution of the real affects the boundaries between representation and abstraction in Folkvine’s perceived reality.

For the average user, however, the literal context of the roadside store is probably little more than a cute and well-themed entry point. Everything the user sees on the first three levels of interaction fits this motif neatly. The site guide and theoretical information behind the artists’ communities and practices are cute, colorful ‘tour guides’ that function as flip books in Flash, and the pages turn like those of books. Their titles—‘Social Economy,’ ‘Re-Creative Identity,’ and ‘Placemaking Imagination’—call overt attention to the academic voice in the site. In fact, the guides themselves form their own little microsite element of Folkvine, one targeted to a user who wants to more deeply explore the philosophies and historical contexts of both Folkvine’s

developers and its folk artists. The tour guides, while on one level simulations of print books, also include embedded multimedia links to video, audio, and more. Another tour guide titled “Making Folkvine.org” remains frozen in time as a “New Guide Coming Soon,” although it seems unlikely that the developers will revisit Folkvine at this time.

The game room, which contains miniature online “board games” to test the user’s knowledge of folk art content, has some similarly unfinished elements. It is possible that the appearance of being ‘under construction’ could be seen as a purposeful strategy that positions the site as an unfinished work. If that is the case, however, it seems like a strategy best targeted at a user group that is not expected to return to the site on a regular basis. This possibility is interesting—the concept of one-hit tourist users who come to the site, gather information, and leave, in much the same way they might visit ruins in Bali. While this might initially seem like a strange strategy in a website predicated on the idea of online community, it does fit very well with the metaphor of the virtual tourist. Folkvine is clearly not designed to function as the kind of ‘Skinner box’ which Hopson and others have posited as a key principle of behavioral game design (“Behavioral” para. 4). Saper states of Folkvine that its intention is simply that “by using the Internet, folk art and scholarship could be available to a larger audience, and encourage these artist communities to expand beyond their geographic boundaries” (“Outside In” -4.50). There are no variable ratio contingencies here that are designed to condition or addict the visitor, or even to compel repeat visitation.

To better understand what Folkvine *is* designed to do, as opposed to what it isn’t, it is necessary to look at the central purpose of the site. For both the ‘tourists’ and the developers, Folkvine’s overt purpose is to showcase the works of the folk artists themselves. As of 2010, there are ten artist profiles on the Folkvine site. These profiles, which are arguably the heart of

the site, are also neatly fitted into the metaphor of the store. They “live” as postcards in a spinning rack on the top left of the store shelf. From this turning rack, the user can pull out each artist’s “postcard” and examine him or her in more detail. At this point, the site moves away from the metaphor of the store for the first time, and once an artist is selected, the format, structure, and media change drastically. By ‘visiting’ through the postcard, the user enters what might properly be said to be the artist’s digital world, complete with linked sites, audio clips, and art images. This final level is closer in form to the traditional conception of a rhizome.

The manner in which these artists are represented within the confines of the postcards provides a fascinating illustration of how personality and individuality translate into the online sphere. In contrast to my other case studies, like *Dimension M* and *Poptropica*, Folkvine does not set out to create a homogenous look and feel—a brand, if you will—beyond its storefront. Each artist inhabits his or her own personalized and unique microsite. Through his own video essay, Saper describes the process of transcription as an attempt to borrow “these artists’ sensibility as a model to use new media—not to romanticize their work, or communities, nor to elevate our work, as recovering a supposedly pure world. No. This is what we wanted to do. To simply use media to get at someone’s sensibility, not just the facts” (“Outside In” -8.10). The *sensibility* in Folkvine is necessarily unique to each artist in a way that precludes any kind of common design or usability templates.

For example, I have already touched on the organizational logic behind the use of the vegetable stand for Ruby Williams, who was one of the first artists selected. Translating Williams’ rough, bright folk art onto an online space meant creating a setting entirely unique to her work and community. As Saper has pointed out, the developers of Folkvine created a microsite that shows an image of Williams’ real-life vegetable stand, paired with photoshopped

images of her paintings standing against it. The user is instructed to “choose a painting” from the stand in order to delve deeper into her biography, works, and studio space. For the most part, the background for each of these segments is made up of blacks, dark maroons, and blues, drawing the focus to the rough wood and bright colors of Williams’ art. It is a microsite setting that has obviously been designed specifically for her work. Congdon further addresses the logic behind the stand as microsite motif when she explains that “alternate and diverse ways of living and finding joy in this world become available as possibilities for all of us [including] Ruby Williams's understanding of the links amongst farming, family, and creativity processes” (para. 12). The vocation of farming is represented through the produce heaped on the vegetable stand, and the links between the farm and the creative process have become quite literal links embedded in the bright primary colors and stylized figures of Williams’s paintings against the stand. Through those paintings, the visitor can enter one of Williams’ “slide show” galleries, each of which has been organized along general topics such as spirituality, community figures, and verbal communication.

The reason for the fundamental thematic and design-based differences in these microsites is clear. The metaphor of the roadside stand could never work as a metaphor for the art of Ginger LaVoie, maker of Hawaiian quilts that are incredibly delicate and finely detailed. To convey the philosophical difference between the two artists requires an entirely different approach to design, navigation, and content. On LaVoie’s page there is no store, and no bright folksy contrast between the art and a dark background. Instead, the background is white, and the splash page opens to a pretty animation of a quilt coming together against a faint background of Hawaiian plants. Mousing over the final image reveals interactive links and descriptions. As Saper describes, the Folkvine team “used the roll-over motion as a tactile analogy for caressing fabric

or *removing quilts from a stack one after the other*” (“Virtual Tourism” 218). The user’s interaction with the site has been structured in a different format than on Williams’ page for a conscious and highly symbolic reason. It echoes LaVoie’s vision of the artist as representational and iconic nurturer and mother, and her belief that “the laying on of the design is a caressing of the quilt. She refers to this process as a ‘birthing of the quilt’”(Congdon para. 14). The textual navigation tip for the user on LaVoie’s Folkvine microsite is also to “smooth and caress the quilt” in order to navigate.

The Folkvine pages for LaVoie and other artists necessarily include text as well as imagery. This could at once be thought of as a strength and weakness of the site—by focusing on the artists as well as the art, Folkvine enters into an explanation not only of how and why each piece is created, but also how the artist’s lived experience influences their art. The developers have utilized several different methods to prevent the use of too many large chunks of text on the site. One of these options is the inclusion of hyperlinks, which add to the self-directional element of the experience. From inside the microsite of one of the third-wave artists, Nicario Jiménez, the reader can choose whether or not to jump from the textual description of “The Past: Cajon Sanmarcos,” into a hyperlink. The text reads, “They [cajones] were usually divided into two levels according to the Andean concept of duality that structured the cosmos (into hanaq pacha, meaning upper world, and kay pacha, meaning this world or earth)” (Jiménez). The hypertext link to the definition of duality also reflects back to the academic underpinnings of Folkvine’s structure. It provides a definition of a term more rooted in academic discourse than in the domain of folk art.

Still, there are large sections of so-called flat, un-interactive text in Folkvine. The biography sections necessarily use quite a lot of this kind of textual content. For example,

“Watch and Pray: About Taft Richardson” has five full paragraphs of uninterrupted text. While Folkvine does an exemplary job of dividing content up and making it fragmentary through navigational links, slideshows, and multimedia, the use of large chunks of text deserves special attention. On the one hand, text is the simplest and most linear way to convey information. On the other hand, there are the considerations raised by the Internet meme TLDR. As one admittedly non-academic web poster put it on the TLDR page of *Know Your Meme*, “if you don’t want your readers to be falling asleep at your long, boring blocks of text, do us all a favor and summarize it.” As multiple ID and usability theorists have noted, large chunks of text online tend to be more often skimmed than read, which is the key reason they are not commonly used in most mass-market video games and online simulations.

I would argue that the use of large pieces of text in Taft Richardson’s bio, as well as at other points in Folkvine, is validated in part by the identity and purpose of the site’s developers. Themselves largely academics from the humanities, and working closely with a humanities council, the developers naturally default to expository text as they create a ghostwritten autobiography, as it were, of the artists. None of the games and sites I have previously studied include this kind of expository writing, despite the fact that some are educational in nature. If anything, they tend to avoid text where possible, deferring instead to the experiential. As James Gee puts it in his 18th Learning Principle, “More purely verbal understanding (reading texts apart from embodied action) comes only when learners have had enough embodied experience in the domain...” (*Video Games* 209). From this kind of perspective, text is most valuable when located after embodied experience. The fact that the users of Folkvine have little to work with in terms of embodied experience calls into question the use of large chunks of text. Then again,

Folkvine is not designed to function as an immersive avatar-based environment, and is in this way exempt from Gee's principles.

It may help to step back from this question for a moment to ask what the best practices are for the use of text in non-game-based educational online content. Chris Nodder of the Nielsen Norman Group points out that “‘richer’ media can actually be ‘poorer’ than text, because they are essentially linear, synchronous formats. Text on the other hand can be scanned, chopped, summarized and repurposed (and translated, formatted, hyperlinked and transmitted) far more easily” (qtd. in Franco para. 7). The irony, of course, is that the web itself is necessarily nonlinear. Even within a contained metaphorical space, like that of Folkvine's roadside store, the user's path through the site navigates an almost infinite order of “stops.” Beyond that spatial disconnect, Google's eye tracking studies also indicate that users of traditional websites scan text so quickly that cognitive understanding is nearly impossible. As one 2009 Google Blog entry states, the Google User Experience Research team “found that people evaluate the search results page so quickly that they make most of their decisions unconsciously” (“Eye Tracking Studies.”). These results indicate that, for the most part, non-academic users have been trained to scan online text to find the link or image that interests them. The text itself is largely overlooked.

To return to the concrete example of Folkvine, should we consider the biography of Taft Richardson useful to the average user? When I first looked at the page, for example, I scanned it without even consciously meaning to, picking out important words and phrases like “bone sculpture,” “prayed to God,” and “art opportunities for at-risk children.” I then clicked into the image link without reading more. In this sense it is Folkvine's audience that is the deciding factor in the question of text-chunk viability. This audience—which is quite likely composed mainly of academics, students, and people interested in Florida folk art—is a very small subset

of the population. In other words, the majority of visitors to Folkvine arrive only of their own free will, and probably only because the topic interested them in the first place. They have an intrinsic form of motivation generated from a genuine and quite possibly specialized interest. A mass-market digital product made for the American school system of 2010 and beyond will not have this luxury. Instead, it will most likely need to follow the mental models already in existence for our consumer economy, where instant gratification is the rule of thumb. As instructional design experts point out, consumers follow a pattern in which

users develop mental models of how different types of websites work. They learn the types of actions to take on an e-commerce site versus the types of actions that will work on a photo-sharing site. This means people will apply their stereotype or mental model of similar websites to make assumptions about how your website works. (Malamed para. 5)

The digital native students who are the consumers of the digital education market are already highly versed in mental models for the small-chunk and experiential communication style of video games and social networking sites. In this sense, Folkvine's use of large chunks of text may not be the best model for a large-scale immersive digital educational environment.

However, this is not to imply that the integration of multimedia is not thoughtfully and thoroughly strategized in Folkvine. The cornerstone of the creative structure, according to the developers themselves, was to build a space that “looks, feels, and sounds like an analogy for each artist, their life story and the story of their work and community” (“Spreading the Story,” para. 4). This kind of goal required the careful creation and integration of visual, kinesthetic, and audible digital pieces. Like most websites, Folkvine has some trouble with kinesthetic learning—other than moving the index finger to click, there are few physical activities possible in a virtual space (the *Wii* and other interactive game systems are a special exception). To the best of their

ability, though, the Folkvine developers implemented a sense of activity. From the “create a shoe” game on the Scott family site to the “open the retablo” command on Nicario Jiménez’s page, the site incorporates much of the language of physical movement. Without these kinesthetic commands, videos, primary sources, games, and Flash intros, the site would be little more than a virtual museum—valuable in the way it brings together and memorializes an element of culture, but little different from a picture book or newsletter. Instead, these elements of multimedia give Folkvine an ethnographic feel, a space dedicated to the preservation not only of the images of art, but also of the living faces and voices of the artists and their studios.

The term *preservation* is an apt description. Like the little bobblehead dolls of the developers, this online community museum is potentially immortal. As long as the host server exists, so will Folkvine. At the same time, however, the user of any website is aware of the potential mutability of each link; if the developers wished, they could change or even wipe clean any elements of the site they wished. Folkvine is not “fixed” in place with any certain lifespan. As Saper puts it, the Folkvine team followed “the trend in e-Media to abolish the fixed “edition” of the great work and so the authority of the great work itself. Such volatility questions the whole conception of textual authority built up since the Renaissance scholars resurrected Alexandrian textual editing” (para. 7). This state of mutability brings up the practical question of archiving in online environments. If we as a society plan to translate our cultural and educational institutions into flexible online media, how do we protect the integrity of the original? *Should* we protect the integrity of the original? And is there any such thing as an “original” in a virtual space to begin with?

The question of how meaning is generated through simulacra thereby returns. As Baudrillard puts it, “Simulation is no longer that of a territory, a referential being, or a substance.

It is the generation by models of a real without origin or reality: a hyperreal. The territory no longer precedes the map, nor does it survive it” (1). While the art and artists as they exist *today* may still be present outside Folkvine, this particular representation and *map* of their works exists nowhere else in space or time. The “real” of Ginger LaVoie’s interactive Flash quilt, based as it is on the physical reality of her quilt squares, is a hyper-real representation of the original(s). The videos and audio narratives inside—themselves unique to Folkvine—represent mutable versions of reality. The extent of this simulation is brought to light, perhaps intentionally, by the inscription under the digital quilt: “Smooth and caress the quilt to navigate.” Is it LaVoie’s quilt? The Flash programmer’s quilt? In either case, unless the user has a touch-screen computer or iPad, they can only “smooth” and “caress” it through the artificial cyborg appendage of their computer mouse. What if LaVoie later destroys the quilts that have come to life on the pages of Folkvine? In that case, there really is no “real” to refer back to.

This mutation of art into simulacra raises some important questions for education. As content moves online, its representation in K-12 virtual spaces is necessarily interpolated by an army of programmers and designers. While a picture of folk art in a textbook may be no more “real” than a flat image online, the interactive multimedia interfaces associated with the art on Folkvine have almost certainly changed it into something *other*. Is there value in preserving an original reference to the real? If so, that would almost certainly argue for a less interactive format in online learning environments. Art history could be learned through online PDF textbook pages or links to the images in virtual museums, much like it currently is in Blackboard and Web CT courses. Yet this kind of vision of education somehow misses the point of a site like Folkvine. Part of the value of the site is its ability to create the hyperreal. In the world of modern interactive technology, any attempt to preserve a static “real” is almost certainly doomed to fail

by way of disinterest. Smoothing and caressing the virtual quilt is far more compelling and interesting an action than flipping through flat slide images of the original quilts. Today's students are accustomed to an immersive, interactive, and entertaining environment, and it is unlikely that PDF eBooks or flat images will work as a solution for the future. In this sense, Folkvine strikes a good balance between interactivity and documentation. The site includes literally dozens of archival images for each artist, and the video and audio are largely unedited originals.

This discussion of interaction in Folkvine brings up another very important element of the site. To describe the nature of multimedia there is to attempt to describe an interactive experience mediated not only by pedagogical imperatives, but also by a very academic form of sensibility. Perhaps in part because it was designed and developed mainly by academics from UCF, the site's different framing and design choices provide insight into the implications that differing theoretical perspectives can have on an academic project. *Quest Atlantis* (also rooted in a four-year post-secondary institution) began from a very similar theoretical standpoint—a search for meaning in the development process. This kind of model forms a fundamentally different framework for development than the ROI-based model. In this sense, Folkvine shifts from ID principles (mass-market) to pure concept. From the perspective of Folkvine, where Instructional Design would be concerned with how to smoothly guide a student from point A to point B on a website, the academic perspective asks the hard questions. What is point B, how is it mediated by the multiple voices of the theorists, artists, and developers, and what does it all *mean* in the end?

The sense of creative agency that is evident in the academic voices inside Folkvine carries through into the scholarship surrounding it in a manner unique to my case studies. *Quest*

Atlantis, for all its inventive genius, is discussed largely through scholarly essays and research projects published in serious scholarly journals. In contrast, the sense of play in the theoretical works of Saper, Congdon, and others is illustrated through multimedia scholarship and other non-traditional approaches. In Saper's "Outside In" video, academic scholarship is itself informed and remediated by the folk art of Folkvine. The scholarly journal article has become a homemade video in which warped and playful images of Saper—his face mediated by media distortion, or seen only from the neck down, wearing a suit while stirring a "script" of cookie dough—purposefully call into light the presence of the theorist as actor in his own text.

One of the overt purposes of this experimental form of scholarship is to call into question the "illusion" of multimedia as a *tabula rasa*. In modern mass-media, the positioning of the developer is often vexed by transparency; it is possible to see a game or website as an entity that has sprung to life full-formed and entirely free of individual human influence. As an introduction to Ginger Lavoie's Folkvine project, Saper says "telling stories using digital media by definition assumes that someone or something is not present. But I'm right here, inside this quilt" ("Outside In" -10:48). Evoking the voice of the developer as *inside*, as an entity that simultaneously makes up and inhabits the online space, creates a new perspective for the roles of both SMEs and developers. At the same time, I must admit that Folkvine's position on the margins of pop culture plays into this theme of invisibility on the design side—in a massively successful product like *World of Warcraft*, GMs and developers are commonly minor celebrities in their own right both inside and outside the game, at conventions like Blizzcon. Theorists of *World of Warcraft*, however, would probably not be quite so celebrated.

In any case, this new mode of 'Folkvinian' scholarship itself remediates and questions the principles of what textual analysis means in the information age. At the end of "Outside In," he

replaces his own image—itself never fully clear—with a comedic image of a hurricane over the state of Florida, “You are here” placed prominently in the middle. Saper’s voice plays in the back of the image, informing the user that his “apparent absence hopes to demonstrate a kind of performative logic, a provocation of storytelling’s possibilities remotely, and also an openness to allow folk art styles to infect the clean efficiency common in big bureaucracies and generic scholarship alike” (“Outside In” -0.47). Saper’s point extends beyond the folk art context of Folkvine. Traditional academic scholarship is by its nature too dry, linear, and text-dependent to serve as a proper vehicle for a discussion of immersive digital media. In my own work in these chapters I often struggle to describe multidimensional and experiential online worlds. Moreover, the first-person “I” in my writing, while a feature often discouraged in formal academic discourse, is a non-negotiable element in my discussion of my own agency. In the interactive digital realm, the formal scholarly voice provides for a one-dimensional perspective, at best.

This new model of scholarship as shown through “Outside In” also raises questions about the site as a living artifact. If Folkvine is, as Saper has posited, a step towards “the virtual cultural tourist sites of the future,” it is necessary to take seriously the question of what those next steps should be (“Virtual Tourism” 222). Of course, neither Folkvine, nor any of my other case studies, can serve as a complete and ideal model. Unlike the other sites I study, however, Folkvine’s development timeline seems to be a complete and finite arc—while *Quest Atlantis*, *Dimension U*, and other sites exhibit continual change through an ongoing iterative development plan, Folkvine is largely static. As mentioned earlier, there are still aspects of the site, like the “Tour Guide: Making Folkvine.Org” that have been labeled as “coming soon” for some time. The concept of Folkvine as a non-iterative alpha is problematic on several levels. From a practical perspective, a site’s platform, design principles, and browser versions can become

quickly outdated. The Flash intros in Folkvine, while suited to Flash 8, are slightly code-heavy in Flash 10 and take some time to load. The *Game Room*, while inventive and fun, does not work cross-platform, and is only available on IE9. The circa-2004 design is also unable to incorporate the latest usability mandates for interactive web products, which provide for a seamless user experience. Folkvine's audio and multimedia elements are not embedded seamlessly into the fabric of each page, but instead most commonly exist as popup links or click-to-play images off each page. Although the site faces challenges of funding and staffing, a beta model would still allow for some level of iterative revision and rebuilding. The digital world is—fairly or unfairly—riddled with interdependencies to the products that translate elements of online media. New browser versions, updates to multimedia platforms such as Flash and CSS, and even changing user expectations, all affect a site's long-term viability. Saper points out that the first issue “for those building virtual cultural tourist centres... involves demonstrating to public agencies that the project will reach the general public in traditional forums (not simply online)” (“Virtual Tourism” 211). If the center is indeed going to remain a stable long-term online “location,” part of this demonstration should be a consideration of the long-term funding and support model.

The notion of the perpetual beta opens the door to a series of proposed “next steps” in Folkvine. One of the first such suggested enhancements would be to refigure the role of the user on the site. While the scholars and the developer class can interact with the site, thanks to their insider knowledge, the average user has no real sense of agency in the site. Less Web 2.0 than 1.0, there will be no mashing or community information-sharing taking place inside the “walls” of this country store. As Saper and Congdon have noted, the concept of social presence is an important defining factor in Folkvine. Despite the apparent absence of hierarchical power on the

site (it has no TOS agreement and no visible moderators), however, the role of the user is still largely passive in Folkvine. In “Outside In,” Saper notes that Folkvine “changed the [folk] art from something anchored in a particular time and place to something that literally meets the user—the appreciators—halfway. It became a model, a blueprint, ready for translation” (-4.52). While this statement is true in the sense that Folkvine brings the art to the user, the person viewing the site is still constrained to the role of viewer. For example, on Ginger Lavoie’s site the user is able to choose his or her own path through the living online “quilts” created in the convergence between folk artist and web developer, but the user is “met” only in the sense that they have agency in where they choose to go. They cannot leave their own mark on the site in any lasting way.

The users of Folkvine have only a nominal level of control over their level of interaction. Nichols defines two distinct forms of interactivity in eLearning environments, and he states that “Indicative interactivity is typified by the use of button rollovers and site navigation. Clicking a button to start an animation or turn the page is indicative interactivity. Simulative interactivity is interactivity that enables students to learn from their own choices in a way that provides some form of feedback” (2). Choosing a path through the Folkvine site does not count as a simulative experience in the sense that users do not receive feedback and cannot truly learn from their choices. In *Dimenxian*, for example, if you get too close to the mutant plant forms, they will eat you. Inside Folkvine, nothing can ‘happen’ to you as the virtual user, and the identification as an active agent is therefore lost. The individual user of Folkvine thereby becomes less an active digital agent in the online community than a visitor to someone else’s world. This aspect of the site was As Saper puts it, “Instead of connections to abstract notions and conceived ideas like tradition and community, the message was conveyed visually and in narrative form. You took a

walk through an artist's world and discovered it as a narrative, rather than as an argument alone" ("Outside In" -1.50). If "you" is interpreted here to be the somewhat broad definition of the non-developer class of visitor, the outside participants in the site have been relegated to passive absorption. There is little immediate benefit in exploration.

In contrast, opening the community to collaborative sharing, item rating, and even exhibit creation fulfils the principles of O'Reilly's Web 2.0, which showcases the ideal of a mashable, open-source perpetual beta that is developed and shaped by prosumers. Could Folkvine's merit as a community showcase actually be improved upon by allowing users to generate and add to content? While the site does allow users to create their own small Flash projects, it is still arguably similar to a physical museum space. The developer-curators and the artists themselves are the only ones who have a continuing sense of presence on the site. User-customization of settings and spaces is not possible in any sense. Tapscott and Williams point out that static websites are nearly archaic now, and that "the new Web is fundamentally different in both its architecture and applications. Instead of a digital newspaper, think of a shared canvas where every splash of paint contributed by one user provides a richer tapestry for the next user to modify or build on" (37). Folkvine is not in any sense a canvas. Users cannot add their own comments about the artists or nominate new artists to a queue for development.

There are slight touches of an interactive community visible through the face-to-face social interactions at site launches, or through the process of learning how to create folk art themselves. Ginger LaVoie's page in Folkvine includes a series of video clips demonstrating to viewers how she creates her quilts, including steps as detailed as "appliqué designs." The streaming video gives the user a kind of access to the artist 24-7, even if she is viewed in a static and unchanging context. Moreover, users could choose to skip the videos and go straight to a list

of how-to links with information on creating quilts. The Web 2.0 component of this site could in this sense be said to take place *outside* the web, in the real-life tapestries of the artist-users. These interstices between online collaboration and real-world creation have yet to be fully explored. Is it possible to argue that Folkvine counts as a philosophical wiki because it encourages users to create the kinds of art they see and admire on the site?

The above argument seems to miss the point of prosumption. In Folkvine, visitors to the website are unable to communicate with each other or alter the site in any fundamental way. As Tim O'Reilly defines Web 2.0, “much as synapses form in the brain, with associations becoming stronger through repetition or intensity, the web of connections grows organically as an output of the collective activity of all web users” (2). The organic power of this open web is not accessible to Folkvine's users. The core team of academics developers did interact with the artists and communities, but the digital product of that interaction is preserved in metaphorical stone. For all its positive elements, Folkvine does not represent a *network*. Certainly the site can be seen as being built, interpolated, and regulated by a complex series of social interactions. At the same time, however, Folkvine allows no formation of consciously shared networks among its user-class, and there is certainly no room for modification. In this sense the site is closer to Thomas Lessl's ‘priestly voice’ of authority, dispensing information to its users from a higher cognitive and technical plane. I do not mean to cast doubt on the intentions of the site's designers—in fact, they worked miracles with extremely limited resources. Instead, I suggest that the next step in the development of Folkvine, or of any community network, must take into account the power of the user-class. The best educational analogy I can think of for this kind of process rests not in art, but in literature. Imagine for a moment that a community of students were each to build their own representation of Plato’s cave. How much might they grow to understand about literary

meaning and situational perspectives simply from touring the caves of others? Arguably, far more than they would from a lecture or essay on how interpretations can differ. One of the unique opportunities in a digital space—and one Folkvine attempted to take advantage of in the development stage—is the opportunity to let the individual help shape his or her representation of an idea.

There are arguments against the implementation of collaborative platforms in Folkvine, however. For one thing, opening the site up to user replication and alteration could affect the manner in which it is truthful to the artists' original intent. The concept of users as complicit contributors to an online environment can also detract from a site's perceived authority on an academic subject. As Tapscott and Williams point out, “most companies consider the innovation and amateur creativity that takes place in communities of users and hobbyists a fringe phenomenon of little concern” (128). Many academics probably feel the same way—Wikipedia, Facebook, Twitter, and Mashable are composed of amateur material that should not be used as a serious reference. If users were allowed to comment on Folkvine at will, I could easily post a note that read, “*Omg luv Ginger LaVoie's quilts. 2 bewtiful. And to think they was invented in Africa!*” This kind of comment unquestionably has an affect on the perceived reliability of the online museum. To prevent this kind of problem with authority, it is almost certainly necessary to implement some kind of “gateway” that filters user interactions.

There are indeed plenty of dangers inherent in allowing users to give feedback on their own individualized “quilting spheres” in Folkvine. For one thing, there is the matter of respect for the artists. The original Folkvine allowed the artists to shape their own space in collaboration with the experienced educators and designers, and there may be ethical issues inherent in changing that model after the fact. There is also little-to-no ongoing administrative control in

Folkvine, so inaccurate or inappropriate content could persist for weeks on the site. This issue is far from unique to the field of folk art, and there will be serious issues with content control and fact-checking on any site where learners are able to shape and define their own environment in real time. For one thing, user-contributors who post “educational” content without an admin filter could be accidentally wrong. Imagine the spiral of confusion that occurs as students in our imaginary digital literary environment title their caves “Aristotle’s Cave,” “Plato’s Hole,” and so on.

For another, there is a very real possibility that *Urban Dictionary’s* tongue-in-cheek Rule 34 will be correct: “*If it exists, there is porn of it.*” While *Urban Dictionary* means this definition in an entirely humorous and entertaining way, it in fact translates to a very serious commandment for the developers of digital educational environments: “*If an opening exists, know that people will try to abuse it.*” Folkvine’s model of user interaction cuts down on the need for filters and human review: in the absence of authoritative control, pranksters could spam inappropriate content, share virus links, and take other actions intended as either malicious or entertaining. It is for this reason that Folkvine’s model is more the norm than the exception for non-password-protected educational sites—collaboration takes place up-front, under the control of the developer/censors, with one-way interaction thereafter. I would like to believe that this model can be challenged and played with in the future, but it will take some serious thought around the development of TOS and NPC gateways.

The power of wikis and collaborative spaces in education are still as-yet uncertain forces. While many districts shy away from any kind of public wiki for reasons of privacy and confidentiality, that model may be changing. In 2007, a Florida textbook adoption committee approved *Freereading.net*, “a remediation program for primary-school children that's believed to

be the first free, open-source reading program for K-12 public schools” (Toppo para. 9).

Freereading.net is not a student site, and its wiki functionality is meant to be used only by educators. Still, early reviews of *freereading.net* were cautiously optimistic. In the view of one of the charter school teachers using the site, *Freereading.net* is compelling because he “can visit the website and comment on what works and what doesn't [then] modify lessons to suit his students' needs and post the modifications online” (Toppo para. 3). While *Folkvine* was clearly not meant to serve as this kind of classroom tool, the distinction *Freereading.net* makes between educator and student is an important point for future collaborative educational spheres. Creating “classes” of users with different permissions can help control issues with user authority. For example, if *Folkvine* were re-envisioned with collaborative spaces, different permissions could be given to the developers, artists, college or school faculty, and so-called “normal” users. This kind of feature would control most issues caused by malicious users or pranksters, neither of which is likely to come from the first three permission brackets. Florida art and social studies teachers who use the site for educational purposes could weigh in on useful features and share lesson plans based on *Folkvine*. Assuming the artists themselves were comfortable enough with the technology, they could post images of new art, update features of their particular page, and even answer questions from users.

However, there are also critics who would argue that the voice of the collective is not a valuable addition to a learning environment. “Promoting” users to contributors would open *Folkvine* to the pitfalls of the trend that Jaron Lanier lambasts when he writes that Web 2.0 technologies serve as “part of the larger pattern of the appeal of a new online collectivism that is nothing less than a resurgence of the idea that the collective is all-wise, that it is desirable to have influence concentrated in a bottleneck that can channel the collective with the most verity and

force” (para. 6). The value of scholarly knowledge in non-collaborative sites such as Folkvine is evident, while the care given to the authentic replication of artistic communities comes from a deep understanding of ethnography and its concurrent mandates. At the same time, the social status of the site's creators lends a sense of authority and stability to Folkvine. As Lanier puts it, “When you see the context in which something was written and you know who the author was beyond just a name, you learn so much more than when you find the same text placed in the anonymous, faux-authoritative, anti-contextual brew of the Wikipedia” (para. 10). The voices of the academic creators infuse the experience of Folkvine: they are the bobbleheads on the shelf, the authors of the *Folkvine Post*, and the faces in so many of its pictures.

There is no simple explanation for the reluctance many educational publishers and academics have shown towards taking a step into collaborative social media. Perhaps the most likely explanation is the perceived separation between the academic nonprofit world and the for-profit agenda of sites such as Facebook and Flickr. This binary division between the nonprofit and the commercial has the potential to put public school systems at a huge disadvantage in the era of interactive online networks. Inside the increasingly splintered collective of the modern web, the knowledge bases of traditional universities become less unique and necessary. As Peter John Williams puts it, the availability of information online “is eroding the value of subject-based knowledge and so the status of the professions” (512). A project such as Folkvine is valuable in the sense that it represents a step into the nonacademic online world, serving as a community resource rather than an authoritarian scholarly voice. In so doing, it preserves the valuable academic sensitivities and understandings that come from years of training in the humanities.

At the same time, Folkvine preserves some of the traditional institutional attitudes toward knowledge: it is dispensed as-is to the collective rather than allowing adaptation and manipulation by its users. In this sense it can be said to be part of the 'old web,' which Tapscott and Williams colorfully describe as being “about Web sites, clicks, and ‘eyeballs,’ [while] the new Web is about the communities, participation, and peering” (19). While Folkvine does an excellent job of representing the communities of the artists, its users are necessarily relegated to the role of observers. The users can take on an active role in the sense that they choose their own paths through the pre-programmed elements of the site, but all these actions are ephemeral in that they do not persist beyond the present. There is no trace of the user-citizen left on the canvas of Folkvine. One of the great advantages of the new online social networks of Web 2.0 is that “the enabling medium of unlimited digital copies--and variants--of original works throws open opportunities for dynamic knowledge expression and also challenges the status quo” (Peter John Williams 513). By cutting off the possibility of variant copies from its users, Folkvine remains in the realm of static knowledge expression. Taking the next step into Web 2.0 would mean giving equal representation to the voices of the users, both figuratively and literally. The bobbleheads on the shelf and the artists in the videos would no longer exist behind glass, but would instead be joined—and possibly changed—by the bobbleheads of the collective.

The second potential improvement that beta development would make possible is in the scope and scale of Folkvine. While the website has unarguably resulted in numerous scholarly articles and spinoff projects, including the so-called Chinavine of Shangdong University of Art and Design in China, Folkvine itself remains somewhat restricted in scale (“Profile”). While not traditionally “educational” in the sense that it teaches a rigorous and standards-based curriculum, Folkvine is still created for educational value. There is therefore a question of who or what

education-based industry would be willing to fund an increase in scale. Garrison and Anderson state of eLearning that “the purposeful process of facilitating an outcome that is both socially and personally worthwhile goes to the heart of the teaching and learning transaction” (13). The transactional value in Folkvine is the manner in which it gives insight into the unique worlds of several largely unknown folk artists. Garrison and Anderson’s reference to the “socially and personally worthwhile” is therefore interesting from two perspectives. To a major educational publisher—or even a startup like *Dimension M*—folk art probably wouldn’t be seen as worthwhile from a fiscal perspective. In the absence of a profit margin, the question then becomes what kind of knowledge can be seen as ‘worthwhile’ here, and to whom.

Groups like the Florida Humanities Council and the Cultural Heritage Alliance, while clearly interested in the cultural benefits of a folk art study, have restrictions and funding limitations that would most likely prohibit the ongoing addition of artists to a larger virtual center. As Saper points out in “Virtual Tourism,” the “publically funded institutions’ mandate, in their *raison d’etre*, that projects provide ‘humanities content to a general-public’ usually in live events and forums” (211). Pure web-based development, while cheaper and easier, is most likely unsupportable through this funding model. There is another aspect of value to the site, however. Folkvine serves as a platform through which its academics theorists and developers can create collaborative applications for much of the as-yet untested digital learning theory. That experiment in itself is immensely valuable at a point in time where there are still very few opportunities to play with applications of theory. In fact, I would argue that the lessons learned not only by the development team themselves, but also by those who read their publications, may be the most socially worthwhile learning outcome of all. The concept of Folkvine as a testing space for theory could make it attractive to large companies or foundations interested in

investing in R&D, or even to federal government groups interested in models for STEM learning.

Because the cost to create truly interactive and adaptable web matrices is so prohibitive, an iterative web 2.0 beta version of Folkvine would most likely have to seek out this kind of backing. One obvious option is to seek corporate funding, as *Dimension M* did through their partnership with Pearson. As I have noted, however, *Dimension M* also provides a quantifiable service for a quantifiable cost. To serve as a worthwhile investment, a site would need to provide an obvious benefit to the parent company, and the corporation in turn negotiates a level of control likely to be antithetical to Folkvine's purpose. The Florida Humanities Council is a poor model for this kind of relationship, since it plays a role more analogous to that of a patron of the arts. Because the FHC isn't concerned about profit, they have little incentive to demand an ROI model for their investment. Of course, they also have little money. To gain the kind of funding necessary for a dramatic revision of Folkvine's content, it would be necessary to target a major corporation. This kind of institution, while often able to invest vast sums of money in development, is also far more likely to look for proposals that include a business case. As Tapscott and Williams put it in their guide to wikinomics, "a lot of the art and science of sharing revolves around hiving off those elements of value creation that you own and monetize versus the value that is collectively owned by the community" (283). There is nothing to monetize in Folkvine, other than the possibility of selling folk art through a forum like that of *Etsy*. This is a dilemma far too familiar to professors of the humanities: it is nearly impossible to attach dollar signs to a website dedicated to folk art.

Beyond the scope of big corporate funding, there is another option available to web developers. Advertising can be an effective revenue-generator for popular websites, although it

clearly has its downsides for a serious scholarly project. On the practical side, advertising money tends to be incremental and tied to site traffic—on Folkvine, there is probably not enough traffic to tempt a serious advertiser. Even if the problem of site traffic could be solved, however, there is still the question of how advertising affects a site’s perceived authority and reliability.

Although I am not sure online academic products can ever be essentially 'free' of commercial influence (they are often developed and used through copyrighted forms of media and browsers), recent inroads into eBook advertising have generated public scrutiny. Around 2006, an online textbook company called *Freeload Press* started offering free downloadable textbooks to students, but these “downloaded ‘books’ are subsidized by advertising from companies like Kinko's and Pure Vida Coffee that appears on the digital pages. (*Freeload Press* does not run ads from liquor or tobacco companies)” (Kingsbury and Galloway 64). The obvious criticism of this plan is that students are the target audience for these ads in what is supposed to be a “pure” academic arena of higher education. Advertising brings with it agendas tied to marketing needs, and in educational technologies can almost certainly be said to exploit a captive audience.

Yet there is still an odd sort of binary inherent in the assumption that advertisers and for-profit publishers can never be a part of a 'pure' educational web. As online social networkers, we accept almost without question the presence of advertising and salable products in social networking sites such as GaiaOnline, and with the exception of very young users most people view them as a transparent and largely unimportant element of the user experience. *Poptropica* commonly includes advertiser-based activities, like the recent opportunity to win your own in-game pig from Nanny McPhee. At the same time, Folkvine already includes multiple *fake* ads for items like ‘sno-cones’ and ‘soda,’ along with 'branded' orange juice and other products. The fact that these ads are not 'real' positions them as artistic and situational art rather than advertising,

and exempts Folkvine from charges of corporate affiliation. The question then becomes the rather mindboggling task of defining why a fake product that the user cannot buy is acceptable to the state institutions funding Folkvine, while an actual product is not.

I do not for one moment mean to suggest that public institutions like the Florida Humanities Project and UCF should abandon their sense of ethics in order to seek advertising money from sexually suggestive, manipulative or otherwise controversial products, as many social networking sites do. I agree that such content significantly detracts from the user's experience with the site. However, in the same way that Folkvine features the Florida Humanities Council and Cultural Heritage Alliance so prominently on its home 'porch,' a site such a Folkvine could potentially seek out a partnership with advertisers for products that have more serious academic or cultural content. While there is understandable resistance to the capitalist slant and evident bias caused by advertising, and it could be inappropriate for UCF to feature advertisements from companies targeting college students, there are still openings for a constructive use of advertisement space. Government STEM initiatives and big non-profits—perhaps even those tied to the art world—could serve as a complimentary facet for a site like Folkvine. While this is a tricky road to walk, dismissing the possibility of advertising and self-contained product sales—two key elements of the for-profit universe—could cripple post-secondary efforts to build sustainable models of virtual educational tourism. It is time we quite seriously explore the possibility of advertising on educational sites. For one thing, it could help fund some truly revolutionary innovations.

Beyond the issues of the audience and market, mobile platforms are a third potential development consideration for a 'future' Folkvine. In the years since Folkvine was created, an increasing number of online games and communities have started exploring the use of smart

phones. When I tested Folkvine on a Blackberry Curve in the spring of 2009, it was impossible to navigate beyond the store's interior. Even from what I could see, however, it was evident that the style of navigation and amount of textual information on the site would have made it difficult, if not impossible to navigate. Purely for investigational reasons, let us imagine for a moment that Folkvine were to create a mobile app. One strategy used by many app-developers is to create a kind of "site-lite" that contains only certain elements of the original, full-service online site. The two key questions in this process are (1) what features can be sacrificed, and (2) what do users want to do with the app? Mapping this process can also inform our understanding of the site's cornerstones, or key meanings.

It would be tempting to posit the artists as the core of the site and sacrifice the icon of the roadside store. After all, it is a project admittedly devoted to preserving and recording the work of the folk artists. When we deconstruct the different elements of Folkvine, however, it seems that the metaphor of the roadside store *is* Folkvine. Without it, there is no narrative thread joining the individual artist pages, and the site becomes little more than a disparate set of pages. The developer bobbleheads and the "site guides" will make no sense, as with the "Folkvine News" paper and commemorative butterfly. This discovery brings up some interesting questions of identity in online spaces. Is Folkvine even Folkvine without the roadside store? What effect has the production of this fictional space had on the lens through which users (and developers) see the artists? From Baudrillard's somewhat cynical perspective,

What every society looks for in continuing to produce, and to overproduce, is to restore the real that escapes it. That is why today this "material" production is that of the hyperreal itself. It retains all the features, the whole discourse of traditional production, but it is no longer anything more but its scaled-down refraction. (23)

This analogy is oddly apt when it comes to Folkvine. The roadside store it produces is an endangered, if not extinct, "real" in the era of Walmart and Super Target. As Saper puts it, Folkvine's roadside store is grounded in the "squalid, run-down, and slight disreputable [look that] often characterized tourism in Florida during the first three-quarters of the 20th-century (pre-Disney)" ("Virtual Tourism" 210). The folksy roadside store becomes almost as elegiac an icon as the folk art it contains. In a sense, that is why the roadside store has come to be such an irrevocably important part of Folkvine; the developers have intentionally created the site as a hyperreal "representation" of a time and a place now largely lost.

An unreal canvas, like the alien planet of *Dimension M* or the superhero island of *Poptropica*, escapes this kind of hyperreal representation. By creating a world that is purposefully unreal, the developers escape the cycle of reproduction of the real. *Dimenxian* easily transitioned from a mission on an alien island to *Dimension M's* desert world. *Poptropica* moves easily from the historical settings of Time Tangled Island to the science content of Shark Tooth Island. The restoration of the real in Folkvine's roadside store works for this specific (and limited) project, but its real-world limitations would be problematic in a beta version of an immersive educational site. Embracing the hyperreal through the surreal/ fantastic is the best way to remove the constraints of reality and create a world easily-translatable onto different devices—mobile, touch-screen, or even VR.

In the end, Folkvine is oddly both related to and distinct from the immersive models I have studied in *Poptropica* and *Dimension U*. Like both of these sites, Folkvine's most important goals are to educate and innovate, and it accomplished these tasks without securing "big corporate" backing. By staying outside the sphere of corporate control, its creators were able to retain the freedom to do exactly as they thought best, with no market surveys or concerns about

ROI to block their way. There are drawbacks to using this model as a larger instructional blueprint, of course. For one thing, it is the specific subject of folk art that gives the site its sense of “difference.” Folkvine’s functionality is not far different from that of the average website, and it does little to encourage active engagement among its visitors. Ironically, one of its great strengths—its independence from corporate control—can also be ruled one of its weaknesses. Because Folkvine does not seek large-scale backing, it cannot reach its own ideal of true virtual tourism, and remains necessarily finite in scope and persistence. If there is one thing Folkvine does serve as a model for, it is the convergence of pedagogical and developmental tradeoffs. To gain philosophical and creative independence in educational web development is often also to confine oneself to a very limited scope and scale.

Despite the issue of funding, Folkvine is an unqualified success in what it has achieved in terms of investigative art and scholarship. While Florida folk art is itself a niche interest unlikely to be of great demand in the general educational sphere, there are a host of smaller niche markets who have gained from the site—including public launches in Central Florida, classroom projects, academic spinoffs, and the artists themselves. I highly doubt the development team working on the project would have traded their autonomy and creative freedom for big corporate funding, even if it could have realized a more fully interactive and iterative Folkvine. The ethnographic learning processes and experiences inherent in the academic group did exactly what they were meant to do—to create a public online museum for selected regional folk artists while at the same time calling into question the existing models of humanities theory and practice. Folkvine was less an attempt to create an ideal online educational model than it was a unique space in which to play with applied theory and collaborative art. As such, it is perfect.

CHAPTER 7: THE STATE OF EDUCATION

In the years since I started writing this dissertation, the face of online learning has morphed and changed...yet remained curiously the same. While I dragged my feet in the hope that we were teetering on some precipice of great change, theorists wrote alternately enthusiastic and dire predictions about the transformative power of eLearning. And virtually nothing happened. Where change did take place, it was on the micro scale. The Florida Virtual School developed an online history game. Tabula Digita rose from a curious start-up to a partnership with one of the Big Three school publishers (at that time, still the Big Four). And still nothing revolutionary happened. The suspense kept me waffling at first, unwilling to complete my final chapter in case something amazing made my whole dissertation antiquated and irrelevant. Eventually, I started to become even more concerned with the fact that it didn't. Where was the revolution I was predicting?

In retrospect, it seems obvious—it all goes back to the very revolution I so often used as an analogy—that of Gutenberg's printing press. The change that swept Europe after the printing press was slow and insidious. Over time, moveable type undeniably changed the very fabric of society and helped to unseat the powerful Catholic Church and bring about the Reformation, and even some aspects of the Renaissance itself. Yet there was no one defining moment in history as it was lived at the time, where people stopped and said "Oh. Now we live in the world of print." It is only in retrospect that we see the Gutenberg Bible as symbolic of a fundamental shift in the creation and transmission of information. To the people of the time, the Gutenberg Bible was probably just that—a Bible sold at the expensive price of 30 florins. Not perhaps as pretty as the ones the monks labored over for years, handwritten on parchment. A little different, and oddly

formatted—perhaps even ugly to those who were used to the illumination and rubrication writing styles of the Medieval church. Still, nobody stormed the printing presses in protest. Nobody stormed the churches and threw the monks out of their cells, either. In fact, the “print revolution” that we now see as so revolutionary had very little effect at all in the short run. The first printed Bibles were still unaffordable to everyone but the elite, and Gutenberg himself failed to make much of a profit off his invention. The Harry Ransom Center of the University of Texas, proud owner of one of the original Gutenberg Bibles, estimates that it took around five years to produce the first 180 copies (Baron para. 5). The revolution was quiet, and viscously slow. It was only many years later, in 1517, that Martin Luther would use the printing press to publish and distribute his *95 Theses* and protest the corruption in the Catholic Church. The printing press may have enabled the Protestant Reformation, but this event took place more than 60 years after the first moveable type Bibles were printed.

The lesson to be learned from this story is that the great, systemic wheels of societal change turn slowly, even in times of revolution. Although we may be smarter, more agile, and infinitely more educated than those denizens of 15th-century Europe, a shift as fundamental as that from the print age to a global and fully-networked Information Age cannot happen overnight. For example, most laptop computers still cost upwards of \$1,000 U.S. It is a cost as prohibitive to most of the world—and indeed parts of the United States itself—as 30 florins would have been to a day laborer in the age of Gutenberg. This does not mean that the Information Age will fail to unseat the established system of public schools and corporate publishers. It will, in much the same way that the printing press eventually unseated the scribe/monks. Perhaps more importantly, the technologies of the Information Age also have the potential to open vistas for development, work, and socioeconomic revolution in non-Western

Asia-Pacific countries (perhaps someday we will be “a non-Eastern country”). But those vistas are not quite open today.

Where are we, today, exactly? In assessing the state of the educational technology industry in 2010, there are several key factors to keep in mind. One of the most literal is the form and availability of hardware for students and teachers. The emergence of a new technologies spurs a frantic scramble to develop education-based apps for it, but it is unclear if a single product, like the iPad, will revolutionize anything on its own. Still, the rush to the craze is frenetic. Less than six months after the launch of the iPad, most of the major educational publishers had already announced some type of partnership with Apple. In September of 2010, Houghton Mifflin Harcourt launched a year-long pilot program for Larson Algebra on iPad. Over the next year, a group of California eighth-graders will use the HMH Fuse app on iPad, a system which promises “‘three-dimensional’ functionality that combines instruction, ongoing support and intervention, allowing teachers and students to customize learning and meet individual needs” (Winograd para. 4). The publicly-released video shows students using a product that retains much of the existing content and layout from the existing HMH eEditions (perhaps fulfilling Sewall’s predictions of recycling). There are some new elements to the Fuse app, however—it is wireless, portable, touch-screen, and self-contained. As the video illustrates, students can pull out the iPad and access their algebra content on the bus, at a coffee shop, at home, and in a study hall. The teacher and student testimonials left on the HMH Education “Testimonials” site still seem tentative about *what* exactly this app will change, with comments like “The kids will be really jazzed. I think it’s cool...” and “It won’t change the way I instruct, but it will change the way kids learn” (“User Testimonials”). It may be simply the wireless

portability factor of iPad that is most clearly new and innovative, or even the extrinsic motivation of using an iPad in the first place. After all, “It’s cool”!

Still, when it comes to iPad, the language of Gutenberg’s print revolution is pervasive. As Dennis Baron, of the University of Illinois points out, “commentators have been referring to the release of Apple’s iPad [...] as a ‘Gutenberg moment,’ or insisting, if they don’t like the idea of the iPad, that it has no hope of being a Gutenberg moment” (para. 1). Baron does not buy into the hype that easily, and he questions how it is that we as a culture even define a Gutenberg moment. If it is indeed the moment of invention that starts the wheels of change turning, he wonders whether the Gutenberg moment may be the invention of the PC, or perhaps a device that allows greater equity of access (para. 7). Baron’s point is well-taken; access to hardware remains a very real issue for students and teachers not lucky enough to be part of an iPad pilot program.

Much like the average European citizen did not have access to printed books in the first few decades of Gutenberg’s work, there are valid concerns about how underprivileged American children, as well as international students in poor or under-networked areas, will deal with the gulf between print and digital. As Baron puts it, “plenty of the world’s have-nots find themselves on the wrong side of the digital divide, being left farther and farther behind as the rest of us [...] come increasingly to depend on the words in cyberspace” (para. 7). Many of the attempts to resolve this gulf have focused on the task of producing affordable computer hardware. An Apple iPad, priced at more than \$500 for the basic model, is a stretch even for upper-middle class American families. It also seems illogical to think that such a fragile, expensive device could prove supportable in public education, outside the realm of pilots. HMH Fuse may indeed be cool, but it’s hard to imagine it as part of a large-scale solution.

More serious attempts to solve the pervasive problem of access—both internally and abroad—include initiatives like the One Laptop Per Child program (OLPC), founded by MIT’s Dr. Nicholas Negroponte. OLPC focuses almost exclusively on the developing world, bringing laptops to children in slums and rural areas. The company’s mission is to give children “a window to the outside world, access to vast amounts of information, a way to connect with each other, and a springboard into their future” (“OLPC Mission”). Connection is key. One of the outstanding features of these XO laptops is that they connect wirelessly to each other to create discrete and mobile local networks. Even where wireless Internet is not available, the laptops themselves create an ad hoc peer-to-peer network for learning and exploration. Furthermore, OLPC seeks to leverage mainly open-source software, stating that "OLPC's goals require a world of great software and content, both open and proprietary. Children need the chance to choose from all of it. In the context of learning, knowledge should be free” (Roder and Parker 6). In this context, the Nokia business model makes sense. As Steinbock points out, Nokia’s business model is based on devices that “work with an operating system that is either open (Symbian, Maemo) or more proprietary (Sseries) and application software (Ovi). The scenario is based on an open, horizontal environment that emphasizes both devices and services” (228).

The availability of cheap, self-networking devices like the XO seems to hold great promise even for American K-12 schools. To enable any kind of wide-scale immersive learning environment, some kind of increased access is needed. In May of 2010, the U.S. Department of Education published a sweeping study on the availability of classroom technology in the public school system. Some aspects of the survey seem encouraging, indeed. Ninety-seven percent of responding teachers said they had access to computers in their classroom everyday, with 93% reporting that they had Internet access as well (“Teacher’s Use” 5). On the surface, technology

seems to be both widely available and amply connected. However, the ratio of students to computers in the classroom on an everyday basis was less promising, ranging from 3.1 in ESL classrooms to 4.9 in areas with a higher percentage of students on the federal free lunch program (“Teacher’s Use” 5). There is clearly a corollary drop in student-to-computer ratio that occurs in some situations, and economic factors are almost certainly an issue. Until there is a 1:1 relationship in all cases, and all students have access to a computer of their own, it will be difficult to build or implement a truly immersive large-scale online learning environment. MMORPEGs like the one I am proposing are by definition “part of a persistent world of up to 2,000 other users” (Yee311). To be both *persistent* and *massively-multiplayer* requires widespread adoption from public schools, and this in turn demands equity of access. Technologies like the XO laptop could help solve the problem of access in part by providing cheap and easy basic access to eBooks and online presentations. However, they lack the graphics cards, CPU processors, and memory that would be required to run a sophisticated immersive gaming system.

Issues of access are one reason why, for the moment, the Big Three of K-12 educational publishing remain largely focused on the creation and implementation of simple eBooks and Learning Management Systems. These systems, termed LMSes, are big business. Houghton Mifflin Harcourt alone hosts at least five major national LMS systems—Learning Village, Think Central, eHarcourtSchool, Eduplace, and MyHRW. Like most LMS systems, they allow teachers and students to access eBooks (publisher-created, of course), give online assessments, search for state standards, and track student achievement. Some systems, like Learning Village, also allow districts and teachers to upload and compose their own lesson plans. While millions of dollars are poured into these curriculum management systems, however, a 2010 collaborative

study with more than 1,200 educators found that

Most of the responding principals in the discussion group thought that social networking and online collaboration tools would make a substantive change in students educational experience, [including] development of a more social/ collaborative form of learning [,] improved motivation, engagement, and active involvement [and] creating a connection to real-life learning (“Social Networks” 6).

Despite this positive outlook, most of the responding principals “reported that students are not allowed access to social networks at school (although principals acknowledge that students can bypass these restrictions with their mobile phones” (“Social Networks” 6). The organizational web may be alive and well in public schools, but the social web is floundering. As the report points out, it is ironic that “students and many teachers are now using online, collaborative technology at home, on the go, and even sometimes in the school hallways—but typically *not* in the classroom” (“Social Networks” 3). If anything, the technological disconnection between students’ lives and the academic classroom is growing.

Today’s colleges and four-year universities have not managed to fully address this problem, either. While there are fewer safety concerns about how college students interact with adults online, FERPA guidelines still require most online environments—at least, those associated with a registered course—to be password protected and to record student performance only privately. As an adjunct teacher at the University of Central Florida, for example, I am not able to choose to build my ENC course using Facebook or Moodles. Online courses there are funneled automatically through Webcourses@UCF, which in turn runs off the for-profit Blackboard Enterprise Vista 8 system. This system is practical and workable, but far from visionary. Inside Webcourses, my Fall ENC 1102 has some simple threaded discussion forums

and some modules where students can go to get information I have posted (either as my own html page, or as an uploaded PDF, Excel, or Word document). The modules are little more than links to internal texts. Although it is possible to include outside links, there is little concrete connecting between students and the “outside” world, and their class projects are completed largely in isolation.

Admittedly, there are aspects of Online@UCF that I have not fully explored. For example, UCF on iTunes U offers some interesting possibilities for mobile applications. iTunes, like other sharing sites, can bring an aspect of the open web to the classroom. Translating college courses into open-source materials, as iTunes or MIT’s OpenCourseWare do, has the potential to create links between the college and the larger community. Apple’s Classrooms of Tomorrow program claims that one of the key characteristics for a 21st century curriculum is that it includes “linkages with local community groups, small businesses, and institutions such as local museums and historical societies” (“Apple Classrooms” 23). These links are less a matter of a literal hyperlink than they are an integrated part of the curriculum—perhaps most analogous to service learning. It would be a good model for colleges to more fully explore, since it seems odd that the learning management systems at a college be closed (and limited) when the ideal is so open. As Apple’s ACOT² points out, through “Web 2.0 technologies such as wikis, blogs, and podcasts, it is now possible to engineer collaborations between students and virtually any other individual or group: students of other nations, experts in a chosen field, university staff, and more” (“Apple Classrooms” 24). If anything, colleges and universities should be at the forefront of this process.

Nor is the situation much different in the private sector. It is true that for-profit virtual schools, which form another arm of the post-secondary market, operate under slightly different rules. Perhaps the best-known example to look at is that of the University of Phoenix, which is

owned by Apollo Group and publicly traded on the NASDAQ (ironically, this parent company is also represented on the nine-member board of directors for Houghton Mifflin Harcourt).

University of Phoenix has more history with online learning than most institutions, and is often seen as “the first academic institution to significantly capitalize on e-learning opportunities” (Hancock *et al.* 31). The term ‘capitalize’ is particularly apt. U of P has recently come under fire from the U.S. Government for its recruitment and retention policies, which critics allege are exploitative and borderline-unethical. Still, the University of Phoenix has done some cutting-edge work with distance learning that does not seem to be motivated solely by profit margin. The school built its own Learning Management System, which today is home to more than 200,000 students. One of the most salient features of this LMS is a forum for blog-style collaboration between students and teachers. In fact, a significant percentage of a student’s grade in one of the FYS courses is composed of online interaction.

While the University of Phoenix has experimented with a virtual organizations platform and online simulations, the core of most of their classes remains this relatively-conservative LMS system. In a 2009 interview, Mike Sharkey, their Director of Instructional Technology, explains that the school’s key concerns are

availability and reliability of the systems...ease of use comes into play. Very big fan of usability. We’ve got our own human-computer interaction group that deals with usability of either our own tools or interfaces with other tools. And then from a higher level, from more of the pedagogical level [...] the way I look at it is, any tool we’re going to implement I ask, ‘is this tool going to help our students achieve their learning objectives?’ I don’t believe there’s one magic tool out there that really helps.

This overriding practical concern with usability and reliability makes perfect sense in the context

of a for-profit school. The key point to take away from this discussion, however, is really that *it makes equally perfect sense for a non-profit institution*. Issues of usability and reliability are one of the key blockers to successful implementation of widespread online curricula at every grade level. While the University of Phoenix may not win any ribbons for their implementation of immersive and visionary new technologies, one thing they do understand very well is the language of access. Students from almost literally all areas of the world are able to log on, join discussion, and post assignments with very minimal hardware and connectivity requirements.

Another successful model for virtual education on the K-12 side is the Florida Virtual School. Founded in 1997, the school has grimly held onto funding through the many ups and downs of the recent economic upheaval, probably due in part to their sterling track record for innovation. Unlike the University of Phoenix, FLVS has invested a great deal of time in edgy and experimental technologies such as their *Conspiracy Code* game, which they designed and built specifically to teach their American History curriculum. This 3-D gaming environment allows students to learn history by playing through a narrative mystery as both a male and female character, in turn. Perhaps the most interesting aspect of *Conspiracy Code* is the fact that it includes integrated aspects of LMS control, and teachers can track assignments, provide feedback, and assess progress through the medium of the game. Even the less-self-contained courses in the FLVS curriculum, such as Science 2, incorporate elements of animation, simulation, and interactivity. For example, students explore the concept of heat conversion by visiting and exploring rooms in a virtual South Pole Research Station. The science modules also end with collaborative projects, in keeping with the focus on 21st century skills set out by AOCT². In this sense, the FLVS curriculum seems to have moved beyond the simple translation relationship of *textbooks: eBooks*. The curriculum—built and modeled by FLVS itself, in

partnership with outside companies—plays with concepts several steps ahead of the industry norm.

As one of the first immersive online games designed and built by a virtual school, *Conspiracy Code* deserves slightly closer scrutiny. In fact, experts believe “it may be the only online game-based, credit-bearing high school course in the United States” (Solochek para. 4). The manner in which FLVS went about building the game may be as revolutionary as the model for the game itself. Instead of attempting to purchase an existing history game, or contracting with a company like *Dimension M* to create course packs inside an existing system, FLVS set out to conceive and build their game from the ground up. Over a three-year period, their course developers worked with academics from UCF to study brain-based learning “to ensure the game would get students thinking in the right ways” (Solochek para. 12). Beyond this immersive study of cognitive and ID practices, the developers also worked to create a detailed storyboard that included not only for the game, but also its internal and external assignments. At some point in this process, FLVS formed a partnership with 360ED, a development company with significant experience in the mass-market gaming industry. Its management team has experience in *Ultima Online*, EA Games, Take 2 Interactive, and the AMRAM missile program’s radar software. The company’s mission statement has a familiar ring to it, claiming that

Over 300 million [virtual] credits are earned annually, and computer education will only grow in the coming years. However, today's online content is inhibited by the static nature of its learning management systems and basic material, making many of its courses little more than electronic textbooks. At 360Ed, we will leverage our experience in interactive entertainment and online content distribution to build the necessary next steps in the evolution of this field. (“Mission Statement”)

The visionary online school had teamed up with a developer that an equally visionary—and experimental—mindset. The resulting game was focus-tested with Orlando students, revised numerous times, and finally released to excellent critical reception. In August of 2010, *Conspiracy Code* won the Codie Awards for Best Reading/English Instructional Solution and best Social Studies Instructional Solution. It was quite a coup, considering the fact that the game’s curriculum is based on Social Studies.

How exactly FLVS came to be able to fund and support the development of its own immersive game is quite a mystery. As a public school, FLVS cannot charge fees for in-state students, but Solochek’s 2009 article notes that “the fees out-of-state students pay helped fund the \$1.5 million development cost of *Conspiracy Code*. Florida Virtual and 360Ed split the cost” (para. 26). While he goes on to explain that FLVS and 360ED have partnered to develop an entire series of games, Solochek does not make clear what 360ED’s motivation was for contributing three quarters of a million dollars, how they plan to make back their investment, or how FLVS itself got approval for such an expenditure. The key here may actually lie in the fact that FLVS, while it runs an accredited public school curriculum, is actually a privately-owned company with its own CEO. It is funded in part through the Florida Education Finance Program, or FEFP, but it does not seem to be wholly “public” or “private.” The idea that immersive games must be funded by the deep pockets of a for-profit company still holds true in an oblique way.

Florida Virtual School does not present a model that will work for the majority of America’s public schools, of course. Of all the prospective platforms and models at play in the market today, it seems unlikely that any one of them will be Baron’s “Gutenberg moment.” However, it may be precisely the multiplicity of angles in modern online learning that will help push education in the Information Age into the truly revolutionary shift we have been waiting

for. Instead of trying to nail down a single optimum delivery mode, or one ideal method of development funding, the key may lie in a larger understanding of the cyborg structures created by the collision of all of these entities. HMH Fuse on the iPad, the University of Phoenix's LMS discussion boards, the immersive gaming system of *Conspiracy Code*, and even UCF's corner of iTunesU—all of them bring new and interesting information to the table. Instead of one Gutenberg, we become legion, a force composed equally of the bored and anonymous student, the visionary game developer, the acquisitive corporation, and the introspective academic. Together, we can effect not one transformation, but a million.

CONCLUSION

Because I posit a pervasive multiplayer universe as the end goal of my study, the rules I have set out are not necessarily applicable to modular, unconnected games, or to individual single-player simulations. I also acknowledge that in one sense, I am doing the very thing I criticize; I am writing about theory and the idea of application without making any attempt to create a working model. From a practical perspective, however, this chapter represents a compromise. It sets out and clearly defines five mandates of educational game design. These common practical considerations are seen not only across commercial models, but also in the majority of successful educational models. The commonalities and discrepancies between my case studies paint a picture of the developing patterns in today's market, and this image supports the five mandates below. The three educational gaming products I study—*Dimension M*, *Quest Atlantis*, and *Poptropica*—are more the exception than the rule in modern educational publishing. While the American Big Three, Pearson, Houghton-Mifflin Harcourt, and McGraw Hill, have all dabbled in immersive gaming, it remains peripheral at best to their core product suites. As we set out to create a revisionist model for educational gaming, however, the rules learned from my case studies as a whole can be summed up in these five mandates.

Mandate 1: Develop a Matrix of Incentive

Extrinsic incentive in the context of an immersive world-based game is both self-reinforcing and largely self-contained. It returns to the principle of *stuff versus status*. For example, an epic weapon earned in a game carries with it the promise of higher achievement, and

failing to earn that weapon may ‘punish’ the player by making it harder to advance. Intrinsic incentive, on the other hand, builds instead off the player’s interest in a more general progress through the game. This intrinsic incentive quite often ties back into extrinsic incentive in the sense that the player gains levels and in-game items, but it may also manifest itself in a less obvious way. Machinima productions and art pieces from *World of Warcraft* players, for example, provide evidence of a deep sense of creative engagement with what it means to participate in a MMORPG. When these intrinsic and extrinsic factors combine, the result is a highly sophisticated and interrelated matrix of levels, gear, crafts, skills, achievements, social interaction, and currency.

There are complicating factors that may be particularly problematic in educational markets. Implementing a system of extrinsic achievement and reward is still quite controversial in an academic environment. However, recent developments indicate that this bias is changing. As Harvard economist Roland Fryer so eloquently put it, “Kids should learn for the love of learning. But they're not [...] Maybe one day we will all approach our jobs that way. But until then, most adults work primarily for money, and in a curious way, we seem to be holding kids to a higher standard than we hold ourselves” (qtd. in Ripley 45). The theories of extrinsic and intrinsic reward are indeed not that far different for children than they are adults. Just as adults work for salary, young students too need a reward to work for, and educational game designers should not expect to fulfill that need through the esoteric satisfaction of a job well done. The education industry needs to better understand the principles that EA Games grasped many years ago: To get people to learn a process—whether it be a repetitive skill set or a critical thinking operation—it is first necessary to make them want to learn it. The task/reward system in an online environment is crucial.

It is for this reason that even a serious academic eLearning program must take into account the principle of reward. Much like a teenager in Gaia Online might spend tedious hours doing tasks that earn them the money for a giant chicken, the tasks students do inside the game must be designed to bring them one of two things: (1) social status, or (2) game-world advancement. To further expound upon on these rules, it is important to recognize that both can also be implemented in an ineffective manner. Social status gained through bribery as money for grades (or the laptops that are awarded in Tabula Digita's *Dimension M* tournaments) certainly does work in the short term. In the long term, though, rewarding students through an outside mechanism falls short by positioning the reward system as something outside the framework of the game itself. Self-containment is an important principle. In *World of Warcraft*, for example, the social order reinforces and polices itself. Rarely do GMs or NPCs have to offer an open incentive to advance, because the players in each guild or group pressure the player to level up and get better gear so he or she can in turn give back to the group.

Social status in an educational game is unlikely to be far different than that of a mass-market game—it builds either through earned levels, or through the ownership of items that are outrageous, rare, or very difficult to earn. For this type of social status to be meaningful, it has to be both difficult to earn and recognized by the other players in the game. The level of difficulty requires a careful balance between challenging and tedious task systems. Difficult tasks in *Fable II*, for example, may be worthwhile because they reward the player with high levels of XP that they can use to unlock a prestigious spire quest and advance through the next levels. The difficulty level of the initial quest is compensated for by the immediate rewards the player receives upon completing it. It is important to acknowledge, however, that for the incentive of social status to be most effective in a multiplayer game, it has to be immediately event to other

players. The player's level or special items must be displayed in a way that is immediately evident to other players. For example, in *World of Warcraft* the player's in-game level is prominently displayed, and other players can even click "inspect" to see all their gear, trinkets, and stats. It is not uncommon for players in PUGs to offer advice to strangers on how to get better gear or use their talent points more wisely.

The ways in which game progression plays into this model is another tricky issue. There are three high-level categories of incentive in the game-world. The first is play for real-world gain, which is an increasingly real issue in MMOs. Rare items and in-game currency can often be sold for impressive profits. In June of 2009, the Chinese government instituted what may be the world's first ban on the conversion of virtual currency to real-life money. Others have defended the practice of gold farming as a part of the game's inherent economy. One of the most outspoken of these profilers is the documentary filmmaker Ge Jin, who in 2006 made the bold statement that

gold farms indicate that the game platform has the potential to engage more people in an Internet-driven economy. The gaming workers in China don't have skills like English, software (development), or graphic design to participate in other forms of Internet-driven work, but they can communicate and navigate in a 3D game world whose tools and routines they are familiar with [...] if more social and economic activities happen in an accessible 3D game world, people who don't have access to other culture capital but (do have access to) gaming knowledge will be more likely to be included in global interaction. (qtd. in Au "Gold Farms")

Interestingly, this profile parallels that of many low-scoring students in American schools. Engaging students from poor urban districts, rural or homeschooled demographics, upper-class

public schools, and more would be a step towards exactly the type of global interaction Ge Jin references. As a player base of a national educational gaming system grew, it is very possible to predict its growth into international markets. Houghton Mifflin Harcourt's English language textbooks commonly sell internationally, sometimes with little to no cultural or linguistic customization.

Perhaps more importantly, Ge Jin's description identifies a way that players who lack basic comprehension in academic skills can navigate gaming environments. Students who are significantly uncomfortable with academic tasks may be able to better understand them through the world of the game. Indeed, game play models elements of visual, auditory, and kinesthetic learning. As Au put it in 2006, Second Life projects have been outsourced to the Vietnamese branch, and "it's easy to see how the Chinese farmers of Warcraft might evolve into the blue collar workers of the 3D Internet" ("Gold Farms"). It is easy to see how a student's sense of agency in a global and networked economy could evolve as well. I fully realize that this point sounds like it comes directly from the hopeful parents in an old *Far Side* cartoon, imagining a Help Wanted ad: "Nintendo Expert Needed: \$50,000 salary + bonus...." Still, there is potential for real-life application in all forms of entrepreneurship, and that category includes in-game harvesting businesses like gold farming.

Regardless of whether or not video game entrepreneurship translates directly to future job skills, however, monetary incentive can take more immediate and practical forms. For example, players inside *Second Life* commonly purchase and rent their virtual property for real money. Interestingly, the legality of ownership in this type of virtual property has recently come under question. In April of 2010, a group of virtual property owners on *Second Life* filed a lawsuit against Linden Labs, alleging that "the company misled players into thinking they owned their

virtual lands” (Sutter). The lawsuit cites California laws on consumer protection to claim that when Linden Lab ‘property’ inside *Second Life* is purchased with real-world money, the company has entered into a contractual obligation in much the same sense as a company that is selling real estate. The case has stirred up a debate about levels of virtual ownership—the main philosophical question at stake is whether a person can purchase and own wholly virtual goods. In this sense, it is important to acknowledge that the concepts of land ownership, brand names, and copyright law are themselves ideas that have evolved fairly recently. Professor James Grimmelmann claims that in worlds like *Second Life*,

we are somewhere in like the 16th century [...] When this stuff started out we were talking pre-feudal –totally made up on the spot. They made [rules] pretty much in response to individual situations. But as this stuff got to be big business, the companies realized they had to start getting regular in administering justice. (qtd. in Sutter)

Grimmelmann’s identification of online law as a 16th-century mindset is insightful in two ways. First of all, it acknowledges the fact that the field is still undeveloped and somewhat backward in its grasp of personal rights. Secondly, and perhaps more importantly, he places the development point of online property law at roughly the developmental level of Europe at the point of Gutenberg’s printing press. Through this lens, we are only beginning to codify the laws of engagement in digital worlds.

Indeed, the idea of ‘ownership’ as we know it would probably look almost entirely alien to a person from the 16th century. Things that are now accepted without question—the ability to legally own a piece of writing through copyright or the idea that a person of any social status can buy land rather than leasing it from a lord who owns it through inheritance—are all assuredly modern ideas that in pre-printing press Europe would have seemed ludicrous at best. It makes

sense then that although the idea of ownership in virtual worlds is alien to us now, it may in future be an accepted part of the social order. It is also very possible that a highly successful multi-player educational game would develop its own real-world money economy, one subject to the same underground black market and legal challenges of a *World of Warcraft* or a *Second Life*.

The emergence of a real-world economy would not necessarily be a bad thing for a successful educational game. American society immerses children in the tenets of a capitalist system from a very young age. As Ripley points out, “the petty bribes—a sticker for using the toilet or a cookie for sitting still in church—start before kids can speak in full sentences” (40). As the grades-for-pay classroom experiment conducted by Roland Fryer shows, some American public schools are already desperate enough to consider bribing students with real-life money. The real question, then, becomes how to create a virtual environment with real-world incentive.

A game economy based on a direct sale of virtual items for real-life money is an intriguing prospect, but in an educational game it should be allowed to develop organically post-release, if at all. There are some additional angles developers could take to approach this kind of a reward system. One such form of sanctioned real-world incentive is a system where the student redeems earned game-credit for concrete rewards, as in the Tabula Digita tournament prizes. Arguably, however, this system misses the point in the same sense that Fryer’s experiment did; a system based on bribery is a one-way incentive system. When a student agrees to do a task—whether that be studying to get an A, or winning an online tournament by solving math equations—they exchange that achievement for payment from an authority figure. Where systems like *Second Life* differ is that the system does not involve an authority figure at all. The other players rent Zed Drebin’s medieval castle for real-world money because they find it fun

and rewarding, and he builds and maintains it because it is both profitable and fun for him—this kind of cyclical system is entirely self-reinforcing and self fulfilling. The most successful immersive educational experience online must somehow build this exact kind of cyclical reinforcement.

Another form of incentive is social approval. The hive mentality is an aspect of online motivation that must not be overlooked. On the most basic level, the sense of interacting in an active way with others has become the expectation in online environments. Think of news discussion boards. Rather than reading articles, the news story commentator both engages with and adds to the stories. How many ‘likes’ you get on your comments become a form of hive mentality—a hundred approvals is a vindication of the original poster’s point, no matter how biased or silly it may have seemed. Part entertainment and part interactive education, the ‘like’ feature on news comment blogs bring out a form of interaction that is far more powerful than the polite environment of an academic classroom. Even the trolls who try to draw out irate reactions from others are actually engaging in a sly and often quite sophisticated level of critical thinking about group dynamics. As early as 1994, Sven Birkerts pointed out that “far more than any development in recent memory, these interactive technologies throw into relief the fundamental questions about knowledge and learning. Not only what are its ends, but what are its means. And how might the means be changing the ends?” (135). Undoubtedly, the means are changing the ends in the sense that public education must deal with a population used to a model of open critique and ‘ratings.’

How then does this model translate to an academic subject? The answer to this point has been imperfectly addressed, and for good reason. Take, for example a skillset like college composition. The course centers around reading and writing in a manner that is very difficult to

translate into immersive gaming. Still, we need to break our print-centric approach to the topic before it is even possible to consider a game that works in the medium. The Internet is full of educational games that ask students to “build a town” by figuring out finance, or “grow a flower” by selecting the right adverbs. Yet these games almost universally fail to inspire a sense of dedication, in part because they are little more than metaphorical frosting on a bran muffin. The key to appealing to digital natives is not solely in making the learning environment interactive and visual, but rather in making it seamless. The skills they learn in the game must be relevant to the narrative and to their own position in it, and therefore cannot be simply ‘translated’ versions of writing and problem-based tasks from a traditional classroom. The true measure of a successful eLearning experience is that it not just teach, but inspire. Imagine harnessing the narrative motivation that inspires the men and women who sit in front of their computers for hours, escaping into the fantasy of *World of Warcraft* or *Call of Duty*—that is a powerful vision of the future of education.

Mandate 2: Leverage the Potential of Avatars and NPCs

MMORPG game worlds are by their very nature populated. They are crisscrossed by players who are busily and actively making connections both with each other and with the world around them. The latter form of interaction quite often revolves around the presence of another kind of character called an NPC. On the simplest level, there are three kinds of characters available to a game designer—whether educational or mass-market. The first category is that of the purely decorative character. These characters may be townspeople in the background or merchants inside store students cannot enter, but their most salient quality is that they cannot

interact with a player. For all intents and purposes, they are like human decoration. The second and third categories—NPCs and playable characters—are the area in which character construction becomes more important.

NPCs, or Non-Player Characters, can take one of two forms. The most common is that of a computer-driven game world characters who has been programmed with pre-scripted behaviors. The player in the game may be able to choose when to approach and select the character to activate the exchange, but the script is prewritten. An excellent example of an NPC is a questgiver in a MMORPG. When the player approaches and clicks on the NPC, the player receives some kind of written or spoken instructions, as well as a quest which appears automatically in their quest log. In more sophisticated games, it is possible for the player to direct the response from the NPC by clicking on one option or another. This kind of dialogue tree is little more than an advanced form of choose-your-own-adventure; the player has a degree of control, but the possible responses are all pre-written and locked down. At this point, I am not aware of any mass-market games that use a true AI interface to simulate intelligent and spontaneous conversation between a player and a computer-based NPC. In the meantime, for educational MMOs, as is the case for their mass-market siblings, there is little reason to change the established model of computer-driven NPCs. The system works well, and most American students are already familiar with its protocols.

NPCs can also be leveraged to provide greater opportunities for educator involvement. The educator/ teacher is a class of participant that is currently dealt with awkwardly, at best, in educational gaming applications. As Gee and Levine rightly point out, “to leverage the potential of digital media to transform classrooms and motivate students, teachers must become tech-savvy” (“Welcome” 51). While their solution is to encourage teacher training in Web 2.0

technologies—certainly a helpful skill for any modern teacher—I propose that the truly visionary model of online learning must involve the teacher as participant/ shaper, not as outsider. In their analysis of MMO learning methods, Schrader and McCreery envision how “the virtual world acts as the training facility, quest information becomes the training material, and Non-Player Characters (NPCs) and other characters act as the teachers” (560-561). One of the keys to success in an immersive environment is a degree of agency on the part of the player/ student. In this sense, the multiplayer game model offers a set of constraints that shape player learning while allowing the avatar to move through the world at will. In the most “simplified view, these games are persistent 3-D worlds in which players are afforded the chance to collaborate, problem solve, and work toward common, self-defined goals.” (Schrader and McCreery 561). Every player must have a character that represents them, and that character must be able to interact with others as well.

One potential model for a teacher character is that of the gamemaster/ developer. As a form of NPC that is set apart by some special designation or aspect of appearance, these characters are usually used to test game features or assist new players. Inside an educational framework, this kind of an NPC could very well be played by a teacher. While this level of involvement will certainly help reinforce the instructor’s presence in gameplay, there are important guidelines around this type of integration. First of all, the teacher-NPC, or TNPC, would need to serve as an expert not only on SME content, but also on in-game skills. Although they may not regularly play with students in groups, TNPCs will need to be available for consultation on game strategy and style, and must also be familiar with the content and purpose of each quest. In a perfect world, the TNPC would have played all the quests as practice before taking on the role. It’s the *World of Warcraft* equivalent to a 12 year old playing as a level 80

warrior with epic raid gear, versus a college professor playing as a level 5 clothie who can't find the spellbook. Rightly or wrongly, the former will get more respect inside the gaming sphere.

The third category of character in the game world is composed of the avatars of the players themselves. As is clear from even the most cursory examination of mass-market games, the options for character-creation at this level can take almost any form imaginable, from a limited set of pre-designed human avatars to an entirely-customizable flower, monster, or alien. For the purposes of my work here, I will divide the categories into subcategories of (A) a single character that all players must become, (B) a pre-set series of characters that can be selected from, and (C) a fully customizable and player-directed avatar that includes self-chosen gender, race, appearance, and clothing. *Halo III* is an excellent example of the first subcategory of player-character. In the single-player game, the human player is always Master Chief, a military male Spartan-III super-soldier with strong cultural positioning and a fully-developed backstory. From an educational perspective, the experience of playing “as” another person or character has potential in many ways. For one thing, it can help build students’ ability to see the world from another perspective. The capacity for innovation and creativity is quite often little more than the ability to see a situation or group from a different perspective. Playing as an adult male soldier, a female servant, Socrates, or an Indian craftworker in Mumbai would all have the possibility to de-center a student’s viewpoint. Until we reach a point where immersive educational games are myriad and easily accessible, however, there are some serious drawbacks inherent in creating a game with only one possible character. Not only will the students be limited in their choices, and possibly therefore in their sense of ownership of and identification with the character they play, but there will almost certainly be issues of diversity. Whatever attributes selected, they would necessarily exclude students of other genders, ethnicities, and aspects. In a political sense, it

could also be problematic to ask users of a government-sanctioned educational game to play only as African males, Asian females, transgendered eastern Europeans, or white males.

The second possible subcategory of player-characters—that of the pre-set series of characters—offers a wider range of options. In an educational setting, game developers have often considered the possibility of having students play as historical figures, or as people in geographically foreign locations. *MtvU*'s mini-game “Darfur is Dying” has the player choose one of a cast of characters, each of which have names, genders, and pre-determined appearances, then forage for food and water in Darfur. If the player does not hide or veers off the correct path, they are captured or die. The game then prompts the player, “As someone at a far-off computer, and not a child or adult in the Sudan, would you like to try again?” This reminder of the very real cultural difference serves to help the player identify with the people who *are* in mortal danger in the Sudan, a technique which can be used not only to increase cultural awareness of a real-world crisis, but also to help increase students’ flexibility and global perspective. As Meredith writes, Americans in the near future “must be ready for disruption and willing to undergo retraining to upgrade their skills and to be ready to change careers to jump on new job opportunities when they arrive” (210). This continual reshaping process we will need to undergo against the changing fabrics of Indian and Chinese job markets demands a highly flexible and global perspective. The ability to see the world from outside a limited American middle-class positioning is vital, and educational games have the potential to teach that skill.

Pre-set lists of characters are prone to stereotyping, too. A 2009 study on video game demographics recorded the gender and ethnic profiles of pre-set characters in the top-selling video games of 2005-2006. Perhaps unsurprisingly, the study showed “a systematic overrepresentation of males, white and adults and a systematic underrepresentation of females,

Hispanics, Native Americans, children and the elderly” (Williams, Martins, Consalvo, and Ivory 815). In fact, Caucasians made up more than 75% of game characters as a whole. Greater and more purposeful diversity in game development is necessary for educational games, particularly in light of the ethnicity-based gaps in access and achievement. The act of restricting the first-person player options to pre-set characters or casts of characters almost certainly helps contribute to this problem of diversity.

One compelling argument for the idea of a pre-set list of characters is the reduction in programming cost and effort that it would cause. Nevertheless, in a perfect world I would still argue that the ideal player character model is the third subcategory—the fully customizable and player-directed avatar with self-chosen attributes. This self-crafted avatar is the norm in games like *World of Warcraft*, where the user chooses their race, gender, appearance, and name. Through this process, a sense of ownership and identification with the character is increased. Certainly, a game intended for students must be more careful than a mass-market game is in ensuring that there are no issues of stereotyping, from overly-slanted eyes on an Asian character to gang colors as an equippable clothing item. The game would also need to be very careful about how sexualized the characters were, particularly in cases where clothing can be taken off and changed. I can only imagine the media nightmare that would be caused by group underwear orgies (a common event in *World of Warcraft*) inside a sixth-grade educational game.

Another downside of this process is that players can select the appearance and aspect that least challenges their own social positioning. One interesting case study is the demographic change that happened when *World of Warcraft* introduced the pretty, Caucasian race of blood elves as a Horde-side character in “The Burning Crusade.” They were the first humanoid and light-skinned character available on the Horde side, which was formerly composed mainly of

orcs, trolls, taurens, and undead. So many people switched from the humanoid Alliance side to play as a blood elf that to this day there are hundreds of discussion boards where other players express their disdain for the character set. As one *WoW Forums* poster put it, “Please [Blizzard], have pity on us Hordies, who bravely endured the influx of Alliance noobs into our population when BC hit, because they couldn’t wait to play out their Ken & Barbie Blood Elf fantasies” (Mordaine). The impulse to normative representation is so strong that it can turn even a world of orcs and undead into an army of Caucasian Kens and Barbies. Striking a balance between this kind of mainstreaming impulse and learner-directed avatar choices may pose problems.

Mandate 3: Define Rules for PvE and PvP

To design a video game without an element of competition is to neuter it beyond recognition. Self-teaching game tasks therefore require the development of a complex system of PvE/ PvP guidelines—Player versus Environment, and Player versus Player. A correctly-designed PvE quest structure inside a game can help reinforce academic knowledge skills, innovation/ problem-solving strategy, and social integration. For example, take the theoretical team challenge to be first to find and bring back the treasure chest. A properly thought-out context for this challenge would first provide background on the (appropriately violent) nature of the quest. A sense of both the danger of the endeavor and the reward for winning is vital to make students excited about the more mundane knowledge-tasks they may have to do along the way. Careful integration of academic knowledge tasks can be completed thereafter. For example, if the academic subject being taught were math, the student teams might need to visit the library in the capital city and do research to determine the proper course to the treasure—a task, of course,

that would involve mathematics.

When it comes to academic knowledge tasks, two hard and fast rules apply. First, it is of vital importance to intersperse these tasks in limited contexts, so as not to drag down the interest of the story with rote work. If skills practice is necessary, it would be best to pair the game with out-of-game practice sheets, the same way students would usually complete homework. A skill learned or practiced in-game can easily be repeated and mastered in a print or digital workbook. The second rule for academic knowledge is that it should be integrated only as real-world logic applies. With an in-game sea journey, for example, it would be perfectly logical for students to have to help plot the ship's course, but illogical and jarring for them to have to answer multiple-choice math questions before they could board. The ideal game is designed less as a rapid-fire drill and kill and more as a holistic method for application and retention. Traditional drill, testing, and practice can be conducted as needed outside the framework of the game.

The dynamics of group interaction pose a more interesting riddle. In the context of educational games, I advocate group work in addition to individual play, since the former serves to teach important interpersonal skills that students need to succeed in school or in the workplace. Multiple studies in the field of education support the guiding principles behind group work, albeit not perhaps precisely in the way I mean it. Group work in K-12 schools is, for the most part, viewed as falling into one of three types, peer tutoring, cooperative learning and collaborative learning—these being distinguished by increasing levels of equality and transactive engagement between students” (Tolmie *et al.* 177). In this view, it is the cooperative learning level which will result in the greatest transactive engagement. Certainly, cooperative learning seems easy enough to address through the fictional context of game narrative. Games can even make the learning process quite literally transactive, as students sell, barter, and work together to

win objects or currency.

Group work has its pitfalls, too—it's very easy for one student to shoulder the brunt of the work while others coast. In addition, it can be hard to create a framework that encourages students to actively choose collaboration with others. An industry model for this kind of environment is *World of Warcraft*, where the more experienced players commonly offer advice and even outright assistance to beginning players. Whether it is an advanced player who has chosen to begin the game again to create another character—for example, an Orc tank who wants to play as a healer priest instead—and who groups with other lower-level players, or a player who has more experience with strategy in a particular dungeon fight, it is more the norm than the exception for players to teach others. *World of Warcraft* builds in two main elements to reinforce this self-tutoring system; they provide reasons to replay the game as a knowledgeable player in a different role, and they make group rewards dependent on the success of all involved. For example, a pick-up-group (pug) dungeon group requires a tank, a healer, and three dps players. If any of these players fails to correctly do their part of the job, the group is unlikely to succeed past the first boss fight, and highly unlikely to gain rare items. Dividing responsibility within the group thereby becomes key to motivating the teaching of others. Ironically, it is this very process that also motivated players to start the game again. If they have already played the quests as a powerful warrior class, for example, they might want to start over again as a magic-wielding mage.

It is difficult to envision how best to practically apply this rule in an educational game. Allowing students to choose a “role” like that of healer or warrior has the potential to complicate and confuse the gameplay—there is no academic purpose to this kind of division of labor. However, creating this kind of a context, which allows students to replay and re-start the game as

new characters, as desired, has interesting potential. For one thing, it removes the game from the context of a temporal class or individual teacher. In this kind of a game model, the students could join at any time and play with others to any extent desired. A student in Alaska could play with a student in Abu Dhabi, assuming they both had a subscription. This kind of a social order comes very close to fulfilling the *NETP* vision in which we move “beyond the traditional model of educators and students in classrooms to a learning model that brings together teaching teams and students in classrooms, labs, libraries, museums, workplaces, and homes—anywhere in the world where people have access [sic] devices and an adequate Internet connection” (51).

It seems clear, then, that it would be desirable to create a framework for different ‘classes’ and roles in the educational gameworld, as well as making the game nonlinear and self-navigating. The downside to this kind of a structure is loss of control on the part of the teacher. If the game is meant to teach and measure academic skills, how is the teacher to track that performance? The most obvious options are to create teacher controls, pair game work with traditional classroom tasks, and integrate teacher reporting structures—even simple digital programs, such as this year’s Houghton Mifflin Harcourt’s K-8 Science Fusion, now allow teachers to view time spent on task and work completed. Teacher controls would allow individual instructors to lock down areas of the game, assign quests only to designated groups, or assign extra credit or remediation to different levels of learners. The downside of this kind of model, however, is that an overly-controlling instructor could seriously impede the learner-directed advantages of the game. To provide a built-in safeguard against this kind of well-intended sabotage, the set of teacher controls should most likely be limited. Students in even the most limited course would have the ability to interact with the environment and with others, and only a limited number of quests could be locked down or controlled by the teacher. One way to

set up this kind of a system would be to give a teacher the option to select a specific number of quests in order to form a curriculum for a class. Those individual quests would be locked, and assigned to students at will, but the rest of the game world would be open to students. Another way to implement control would be to allow teachers to set the achievement/ reward structure for their class.

There is also the question of what degree of violence to allow in the PvE or PvP narrative. Most educators' initial response to the question of violence in educational games is likely to be highly negative. And yet almost every successful mass-market game (with the exception of games like *Farmville* or *The Sims*) revolves almost exclusively around violence—PvE, PvP, and quite often a combination of both. As more games become multiplayer online, users are becoming increasingly used to the idea of teaming up with strangers to kill other strangers. In contrast, most educational games tend to distance themselves from that theme, creating more “civilized” pretexts that involve care of an area, non-violent problem-solving, or other variations on these themes. *Quest Atlantis*, for example, openly eschews any kind of competition between students. However, there is a subtle and subversive metaphor of violence developing in the narratives of *QA*. In *Plague World*, if you choose to free Frankenstein's monster, himself a metaphor for the perverse corruption of man, you release him into a corrupted and broken town.

Other educational games, such as *Dimension M*, have moved towards an unashamedly PvP-based mode, complete with guns. It would be a mistake to assume, however, that violent tropes in video games should be viewed in an unqualifiedly positive light. Anderson points out:

Repeated media violence exposure increases aggression across the lifespan because of several related factors. 1. It creates more positive attitudes, beliefs, and expectations

regarding use of aggressive solutions. 2. It creates aggressive behavioral scripts and makes them more cognitively accessible. 3. It decreases the accessibility of nonviolent scripts. 4. It decreases the normal negative emotional reactions to conflict, aggression, and violence. (para. 17)

While the link between virtual violence and real-life acts of aggression remains a topic of serious academic debate, there is no reason to doubt Anderson's first point. If a student spends hours per day playing a game in which violence is the solution to all problems, it would be more unusual if they did not apply their experience there to the real world, at least in terms of mindset.

That said, however, I posit that a degree of violence is needed in any game that intends to seriously compete for the attention or engagement of today's students, or in fact to teach them competitive strategy in the first place. At a rough measure, there are four levels of violence possible in a game:

1. Gratuitous and realistic violence towards NPC humans (killing hookers/*Grand Theft Auto* or corrupting villagers/*Fable II*). This level encapsulates different forms of violence for the sake of violence; destructive acts which do little to advance the narrative thread, and benefit the player in only the most ancillary sense.
2. Competitive violence committed by the player/avatar against other players, either in self-defense or to achieve game ends.
3. Achievement-based violence committed by the player avatar against humanoid NPCs or non-human NPCs, either in self-defense or to achieve game ends.
4. Violence which plays out in the backstory of the game, as visible through the video montages or quest contexts, but which is not committed by or instigated by the player.

The first category of violence is almost certainly not appropriate in an educational context.

Whatever the (evident) popular appeal of beating a hooker to death, this kind of action simply cannot be sanctioned in any educational game. It is the second through fourth categories of violence that pose more of a debatable ethical issue in educational game design. Properly framed and crafted, violence can add to the appeal for digital natives who are already familiar with the idiom. Recent releases of educational games are already playing with the idea in different ways. Tabula Digita embraces the second category of game violence in their successful multiplayer math tournaments—students openly shoot other players with futuristic guns. Public schools including those in New York City, Miami, and Houston have embraced the model with little to no objection, in part because the game narrative so carefully crafts a non-violent metaphor. Rather than killing other students, the players are ‘freezing’ them and using mathematical formulas to take down their shields. Once the shields are down, the other player is ‘transported’ back to the starting base. By carefully avoiding any impression of physical harm, the game flies under the radar of groups concerned about video game violence.

To a certain extent, however, the Tabula Digita model is a copout. It gives the illusion of first-person shooter violence without following through, and in this sense, it seeks almost to trick the student players into thinking that they are playing a mass-market video game. The ideal future state for an educational game would be for it to walk this line in a more nuanced sense—to incorporate violent elements that advance the narrative and present a threat, without requiring students to physically fight one another. I argue that the second category of game violence (violence against another player) is not the most beneficial way to approach the integration of physical conflict into educational games.

Instead, the ideal game would be one that incorporates enough violence in the backstory and in the NPC gameplay to provide excitement and incentive, while pitting students against

each other in a constructive manner. For example, a team competition to see who can be first to find and bring back a treasure chest could easily be made more challenging and more interesting by the need to fight and/or outwit non-human NPCs along the way. This splits the group side of the competition from the violent side, and preserves the sense of civilized interaction with classmates (appropriate training for an academic or corporate context) while integrating conflict with an opponent. If framed correctly, the challenges of conflict can also teach group strategy and innovation.

Mandate 4: Create a Literary and Nuanced Game-World Narrative

As Gee and Levine put it, “we live in the age of ‘Pro-Ams.’ Pro-Ams—professional amateurs—become experts at whatever [digital media] they have developed a passion for” (“Welcome” 49). Passion is more fundamental to successful eLearning applications than most theorists—ourselves often digital immigrants—give it credit for. The principle of drill and kill in online environments is no more useful than it would be in a traditional classroom. In this sense, the large publishing houses have it right: There is no reason to invent a sophisticated, expensive, and engaging online multiplayer platform *if it does not solve the problem of engagement*. In the United States, many argue that we are “witnessing a growing student engagement crisis [since we have] dropout rates approaching 50% in many urban school districts (Swanson, 2008), and recent education surveys showing that students are overwhelmingly bored in school” (Gee and Levine “Welcome” 49). Increasingly, we hear American teachers, principals, and leaders blame the lack of student engagement on the inability of traditional print/ lecture formats to engage a

generation of digital natives; texting while their ipods play music videos and they watch *Call of Duty II* present a world almost more visceral and real than their own.

The real problem is that these teachers, theorists, and leaders are exactly correct in their assessment. It is almost certainly the new modality and new realities of the networked world that make it impossible to engage students through print media. How we establish what constitutes play in the context of academia is a more difficult question. Sven Birkerts cautions that “knowledge, certainly in the humanities, is not a straightforward matter of access, of conquest via the ingestion of data” (136). Video games as a whole are almost certainly based on the model of conquest—the player moves through the world with the goal of winning the Fable Crucible, achieving level 80 in *World of Warcraft*, or defeating the Covenant in *Halo III*. It would be a mistake to entirely replace the current academic model with a game in which knowledge tasks were literally “conquered” and then forgotten. However, the “ingestion of data” model Birkerts refers to is much more of an issue in the traditional public school classroom. Students there ingest facts and equations with the goal of regurgitating them on standardized tests or receiving an A, not as part of a means of creative and innovative thought. In contrast, a well-constructed game can create a sense of investment in the learning environment, particularly when learning skills are a seamless component of the narrative.

There is another powerful advantage to the dream narrative format of games as applied to an educational setting. Birkerts wonders what will happen as the availability of online knowledge surges, asking “the technology may be able to handle it, but will the user? Will our narratives—historical, literary, classical—be able to withstand the data explosion?” (138). One of the great strengths of a narrative educational game is that it provides exactly the kind of narrative fabric Birkerts references. A correctly-structured and created game has the potential to tie the

entertainment, educational, and private discourses of the modern world together, and give them meaning. Traditional textbooks do not do this. In fact, Ulmer defines the textbook as “historical fact, grounded in the conception of history as the nation’s book, which we may study and gloss for signs and traces of prophetic messages” (*Internet Invention* 82). His identification of the learning process as “prophetic message” identifies a key element of modern education that Americans *must* change to remain competitive in the global market—the idea of educational texts as iconic dispensers of wisdom. Rather than acting as a passive receptacle for wisdom (whether from the teacher or the textbook), students must take an active role in the interpretation and application of meaning. Few better forums exist for this kind of transformation than that of the immersive game narrative.

How then can a narrative be structured to accomplish these goals? Many educational games situate the story in so-called real life, with a student learning to run a suburban town or complete a board game. For example, Disney’s *Great Piggy Bank Adventure* allows the player to choose a 3-D animated avatar to “play” as a board game piece. The game is cute, well-designed, and integrates educational material in an engaging and strategic way. The player has the freedom to choose their own goal, such as a remote-controlled helicopter for 140 truffles or an artist’s easel for 100 truffles. Once in the game, they can spend the truffles in their piggy bank in a quirky little 3-D shop, to buy items that will help meet their chosen goal. In between visits to the store, they roll virtual dice to advance along a gameboard. At each stop, they answer “spending wisely” game cards and a “help” feature formatted like a little online newspaper. In short, it is very like a board game one might play with one’s family.

Whatever advantages this storyline may have in terms of deflecting controversy, however, it does little more than simulate a fairly simplistic version of reality. “Reality-based”

suburban narratives also have the potential to lose students from an inner city, or bore students who already live in suburbia and play board games. There are powerful arguments for the use of a fantasy-based model instead of a real-life setting. There are two main factors that give fantasy environments an edge: They create a neutral playing field (biased towards no particular life experiences), and they provide a new and unfamiliar environment to explore.

The latter is particularly important from the perspective of the industrialized West, where everyday life tends to be highly conformist. Children grow up wearing clothes of the same label, going to schools that have the same set grade levels, and participating in shared cultural contexts for music, entertainment, and free time. When most reach adulthood, they enter a highly hierarchical workplace—often in the cubicle land so often satirized in modern movies—and proceed through the ranks of promotion into the almost entirely regimented work environment of middle America. Video game worlds, on the other hand, provide these students and workers with the opportunity to actively explore new frontiers and new civilizations. In many cases, they also serve as a forum for an almost literal fight for survival. In a world where we have no real natural predators and few immediate dangers, video games simulate the adrenalin rush of life or death situations. To the extent that players come to identify with the game avatar as an extension of themselves, the rewards of exploration and dangers of death in the game are very real. As applied to educational environments, this kind of game-based danger could help foster exactly the atmosphere of creativity and innovation that Meredith talks of when she says:

There is one thing impossible for any company to move overseas, and is difficult for other nations to duplicate: America's essentially scrappy culture of thinking of, funding, and bringing to market new ideas and ventures—its people's inventive, can-do mindset. [...]

Americans are flexible and creative, are risk-takers, are the world's optimists, and are at their

best as underdogs. (212)

The current structure of the U.S. educational system—with its years of regimented coursework and standardized testing—fosters a mindset antithetical to the one Meredith describes. In fact, the attributes she identifies are far more likely to develop through the world of fantasy in gaming.

By ‘fantasy,’ I do not mean strictly the definition of sci-fi fantasy. An alien planet and a World War II battle in Siberia are equally alien to the modern player. Each provides an equally fruitful platform for exploration and creativity. The problem-solving skills needed to track and identify the alien enemy in the jungles of *Halo III* are very similar to those needed to infiltrate an enemy bunker in *Call of Duty II*. There are also multiple possible variables in fantasy NPC and player options.

Another vitally important part of narrative-building, particularly quest-building, is what I term the TLDR Principle. TLDR, the Internet slang acronym for Too Long, Didn’t Read, is one of the cornerstones to any successful immersive educational experience. It’s easy to argue that a simulation, like real life, can draw off of long written documents. In an architectural simulation, for example, the student may need to consult multi-page written requirements, specs, and blueprints. The kind of integrated system I am proposing is distinct from this kind of model in one main way. It is the mode of unconscious experiential learning which Gee defines when he says that players “learn how to ‘read’ the physical environments they are in to gain clues about how to proceed through them” (*Video Games* 109). The experiential environment both provides clues and auto-corrections for the player when they do something wrong. In many mass market games, when you get it wrong your character quite literally dies. It’s a powerful motivator for task acquisition.

In video games, the informational segment quite often occurs through the lens of a mini-movie. At the beginning of *God of War III*, for example, Kratos moves around the screen as a

character having a conversation with Gaia. The actual player just sits back and watches. A great deal of expository information is provided that will be integral to the player's understanding of what they must do, but this information is communicated through the format of an animated movie—there isn't a shred of text on the screen. If we apply this approach into an academic topic, it might be tempting to argue that the information is too vital to skip past, and that the student needs some kind of printed record to refer back to. It's possible to provide written material in the form of a virtual PDA, or backpack, that the student can refer back to, but that still misses the point. The key to the information in *God of War III* is that only the highest-level understandings are vital (“The gods are bad; I should be fighting the gods,”) and that everything else will be reinforced and revisited in informational clips and scenes as you progress. The vital information is not the context, but the practical skills that are learned.

The manner in which practical skills are ‘scripted’ into narrative is far from a simple linear process. Gee identifies “flow” as one of the most important narrative structures in educational gaming. As he notes, the concept of flow “has three parts, all of which are crucial in game design and, indeed, in all deep learning. First, you need to be faced with problems that are challenging, that give you a little anxiety or anxiousness, but not so much as to deskill you” (Gee qtd. in “Part I”). A good game narrative must be scalable, in order to entice learners to participate on a sliding scale of challenge. There are several narrative strategies that can be used to scale down challenge. One common style in MMOs like *World of Warcraft* is the “skill quest,” a small reward-based quest that is specifically designed to teach an in-game skill. Before taking part in the arduous multi-step Argent Tournament quest, in which players “joust” for redeemable tokens, a new player receives a series of skill quests. One of the NPCs gives the player a quest that requires them to use their lance to successfully break three stationary targets, while the other two teach shield and rush skills, again with

stationary targets. Only once these quests are complete can the player enter the confusing and skill-intensive tournament quests that involve jousting with live targets. The likelihood of players giving up on the live joust quests is mediated by their understanding of the practice quests. This kind of structure is just as easily implemented in an educational framework.

The second level of flow is one in which the player has managed to “practice enough, with some failure, until you get to the point where the problems still feel challenging, but you know you can do them with enough effort. This is ‘flow,’ the state in which you are most intensely focused and most satisfied” (Gee qtd. in “Part I”). From an educational perspective, the game narrative must give students space to *play* before moving on to the next lesson. In a STEM context, for example, learning how to design and build your own battle-bot in-game pet should be a challenging and knowledge-intensive task. At the same time, it must also be replicable on a sliding scale. Building a larger battle-bot with different abilities could be a suitable next step, where designing and building battle aircraft might not be. Mastering this balance between challenge and entertainment is precisely what will lead to Gee’s third level of flow.

As Gee points, out, at the third level “you practice so much the problems are mastered and you enjoy that mastery for awhile before seeking newer, more challenging problems, which allows you to ramp up your skills” (qtd. in “Part I”). This third element of flow speaks to the need for player-direction in the game. Most MMOs have a range of tasks within a given skill set, as well as the option to take a ‘fast-track’ leveling path that is much faster and harder. So-called ‘power-leveling’ from 1-85 in *WoW* demands a sophisticated knowledge of strategy, overlapping in-game tasks, and a swift mastery of the new skills and talents gained with each level. In contrast, a casual player could spend the same amount of time doing quests inside their comfort zone and learning how best to use their talents. That type of player would advance much more slowly because they stay in

their zone of mastery, and they may be at a level in the early 20s while their power-leveling colleagues have already topped out at 85. The narrative is the device that enables this type of balance, in part by functioning as a “choose your own adventure” format. Beyond that level, however, is the possibility for exploration. Anybody can write a narrative—it is far more difficult to build the interconnected multiplicity of narratives that make up a living world.

Mandate 5: Provide for Scalability/ Beta Development

One of the keys to survival in the freeform world of the interactive web is the perpetual beta, a model that allows for constant growth and innovation. For one thing, a well-constructed beta model helps mitigate the time to market. Instead of taking three years to develop all the (current) islands in *Poptropica*, for example the game went live in 2007 with just one island. This kind of iterative launch model has many side benefits, including lower up-front development costs and a greater opportunity for user-related efficacy studies. In a sense, the past three years have served as *Poptropica*'s UAT. However, to successfully execute the implementation of a beta game-world with an expanding geography takes careful construction. In *Poptropica*'s case, the game was designed as a series of islands that characters can travel between using a blimp. The very looseness of this structure—the lack of definition around how many islands, or how they might be linked to one another—makes the game very easy to develop in an iterative fashion.

A strong framework for beta development also provides an opportunity to expand the original academic context. Tabula Digita's first game, *Dimenxian*, did not fulfill the requirements for this aspect of beta, in that the storyline itself was very closely tied to mathematics. As Kep Harris navigates to the weather stations by using grid coordinates, it is almost impossible to imagine him

navigating there instead by using his knowledge of present progressive verb tenses. In contrast, the next-generation *Dimension U* solves this problem in two ways. The narrative has abandoned the science-based storyline of bio-digital mutation, and PvP gameplay has become more oriented towards progression through solving multiple-choice questions, which can be used in almost any disciplinary context. In addition, the “universe” of *Dimension U* has divided itself into discrete “worlds” for each of the major K-12 disciplines—mathematics, science, social studies, and reading. This kind of shift in basic structure has enabled the easy transition into beta.

There are almost infinite reasons to argue for a beta, as opposed to a closed system. As *Quest Atlantis* shows, there are technical issues that can arise as new areas are “tacked” onto existing worlds, but none of these issues are insurmountable. The *NETP* report agrees, arguing that an iterative approach is also needed in order to test out what works and what doesn’t. In calling for both “iterative design and development,” they argue that instead of “expecting to find an ideal turnkey approach, states and districts should define, test, and refine new ideas on a trial basis and measure both how they are implemented and their results” (67). This perspective makes sense from multiple perspectives. For one thing, as the *NETP* report points out, “research on the effectiveness of learning technology typically comes after products and services have been deployed—when it is too late to result in major improvement—if it comes at all” (75). Inside an iterative beta, it is never too late.

The perpetual beta also offers tremendous potential for prosumption. As the gameworld expands, there is no reason not to plan for the inclusion of student-generated content. Particularly in a gameworld that crosses several grade levels, it is both plausible and beneficial to have students engage with STEM-style content by building their own working models. For example, STEM students in engineering may design and build their own robot in a simulation-based online laboratory. If this laboratory were properly-integrated into the world of an immersive educational

MMO, there is no reason the student could not then take their robot with them as they continue through the world, using it to help them fight enemies and solve problems. Nor is it impossible to imagine teachers, parents, and other experts in the role of casual prosumer. As Tapscott and Williams envision prosumption, it is “like tapping the most uniquely qualified pool of intellectual capital ever assembled, a reservoir of talent that is as keenly and uniquely enthusiastic about creating a great product or service as you are” (147). The pool of talent in the wider educational world—outside the classroom—fulfills one of the core requirements of *NETP*’s plan for the future. The principles advocated by Tapscott and Williams—greater access to raw content, platforms for user-generated development, and conversation versus monologue—are also the core principles behind a truly all-encompassing model of beta development.

Rather than transmitting information and ways of learning to students as monologue (whether print or digital), it is vital that we begin to allow the students to shape the medium as well. Of course, this process functions as a double-edged sword in pre-secondary markets. If third-graders were allowed to create their own curricula in school according to their desires, school might quickly take the form of a combination virtual Barbie dream house and first-person shooter game. Control from the administrative side must be balanced with a kind of freeform adaption on the student side. The most obvious examples of this kind of balance in modern classrooms take the form of simulations. As Gee and Levine posit, the digital age requires educators to “retool foundational literacy skills and link them with other competencies—such as critical thinking, collaborative problem solving, and media literacy” (“Welcome” 50). Existing simulations allow for control from the pedagogical side, while guiding students to make exactly the sorts of links Gee and Levine target. It seems clear that whatever form tomorrow’s jobs take, the key skillset will be the ability to innovate with technology. In this sense, simulations and MMORPGs blend both impulses, since

domain knowledge (i.e., game content, plot, etc.) and the means to acquire it are not the only areas in which gamers need to excel. With respect to videogames, successful gamers must also master the technology. Mastering technology is tied to simple tasks like installing and running the game to more complex tasks associated with optimizing the game experience. (Schrader and McCreery 561)

As James Gee argued back in 2003, playing video games teaches us not only game skills, but also high-level strategic application that is ideal for transfer. Strategic application is both difficult to teach through a traditional classroom structure, and badly needed in the modern workplace. Meredith concludes in her study of outsourcing models, that “There is one thing that it is impossible for any company to move overseas, and difficult for other nations to duplicate: America’s essentially scrappy culture of thinking of, funding, and bringing to market new ideas and ventures—its people’s inventive, can-do mindset” (212). One of the key predictive strengths of user-generated content in a beta game is how it can provide training for the future workplace, rather than the present. The digital natives themselves would be able to bring to the table new perspectives and voices not known by the panoptic voices of the developers and theorists.

Following Up: Practical Considerations

No good immersive educational game will succeed in the long term without incorporating the above five mandates at the high-level—there must be incentive to play, in-game characters, an element of competition, a gameworld, and a sense of adaptability. At the same time, the specific forms of implementation I provide as illustrative examples are not intended to constrain creativity. The idea of an NPC, for example, could be entirely replaced with a different kind of in-game device

for knowledge-transmission. These rules are meant instead as a starting point for best practice; a ruleset of game philosophy from which to begin imagining a solid educational game structure. Beyond issue of philosophy, however, there are also three practical categories of questions that any academic—or indeed any company—must ask themselves before setting out to scope the development of an immersive eLearning environment.

The first, and potentially most important, up-front set of practical questions refer to the target medium and delivery platform. The groundwork required to answer these questions can be arduous, and far from appealing to a group of creative thinkers. However, it is no longer possible to just say a game has been developed for “the Internet.” Modern educational games can be developed in html, C++, OpenGL, Flash, EIAS 3-D modeling, and many, *many* other applications. There are basic hardware requirements for running the more sophisticated games (hardware not always available to K-12 schools), and a whole host of new concerns when it comes to developing apps for mobile devices. The questions of whether the game should be an install, run on a native browser, and how, are very real and practical issues. The philosophy of the game, as well as a clear definition of its target audience, should help drive the scoping process. The more restrictive the platform rules are at first, however, the easier both funding and development will be. There may be no compelling reason that students need to complete real-world tasks and “check in” via a mobile app, a la Foursquare. In fact, it is important to keep in mind that the new “it” app may very well be outdated by the time a product is launched.

The rapidly changing nature of technology, while intimidating in some ways, also provides unexpected opportunities for innovation. GPS apps on products like the iPad can now enable very real-time interactions. For example, the Star Map allows users to hold up the iPad and see what the stars in front of their position are named. Leveraging this type of app has some very exciting

possibilities, but it has limiting factors as well. Unless students own an iPad, they cannot use it in the way it was intended, and the price tag attached to a product like the iPad raises some quite understandable concerns about equity of access. In response to new Texas legislation that made state funds available for technology purchases, Gail Lowe of the State Board of Education pointed out that “some homes in south Texas, in the barrios, don’t even have electricity, much less laptop capabilities. I think we’re putting the cart before the horse. It’s important that students grasp the material, not that they have a new toy to play with” (qtd. in Thevenot). In the face of such issues, I cannot even attempt to legislate any clear rules for platform and delivery method here. The key issue to keep in mind when making this decision is the specific access, firewall status, and hardware needs of the game’s target audience. To a very real extent, the more technically-savvy and imaginative an immersive educational platform is, the less likely it is that school districts will be able to use it.

The second set of practical questions any prospective MMO development group must answer is that of funding. While there is tremendous surface-level enthusiasm for educational gaming, there are few companies willing to take on the challenge of partnering with academics to create an immersive yet rigorous interactive MMO. The heart of this disconnect lies in the gulf between “vision” and “profit.” A sustainable vision of an online edutopia does little to open the pocketbooks of the big publishers, in part because they fear facing the same problem as online newspapers and magazines. In 2009, Rupert Murdoch announced he was actively searching for a plan to generate revenue streams from his company’s online sites, such as the *Wall Street Journal*. Users reacted negatively, on the whole. One *CNN* commentator, Syeed Ali, said that “as long as there is internet, there will be free content. And as long as there is free content, sites trying to grow on a paid-content business model are not going to survive. It’s a simple as that” (qtd. in Hooper para. 5). Experts tended to agree, and Joshua Benton, the director of Harvard’s Neiman Journalism Lab, noted that

“‘putting a lock and chain on the home page was not an option for most websites,’ but that online publishers needed to find a way of generating revenues from ‘a small slice’ of users willing to pay for content” (qtd. in Hooper para. 21). Clearly, this model would not work for an educational game which has taken millions of dollars to develop. If anything, the trend in educational markets is moving away from a subscription service, with the state of Florida adopting Freereading.net as a state approved open source reading program (2008), and California’s Free Digital Textbook Initiative of 2009/ 2010. With the notable exceptions of *Dimension M* and *Quest Atlantis*, public schools have shown little unified support for a subscription-based model of educational gaming.

This environment is not conducive to the development of immersive educational environments. It takes millions of dollars to get a MMORPG up and running, and even Pearson’s well-funded *Poptropica* (hardly a MMO in the true sense of the word) has emerged at a snail’s pace from beta form. The industry games often survive through a subscription-based model, and that model is changing fast. As Steinberg points out of Farmville, the emergent model is that of games that “aren’t just designed to be played in completely different methods and manners. They’re meant to be enjoyed in different context and timeframes, and constantly updated and refined based on player feedback, defining them more as services than products” (“What?” para. 7). Keeping up with these market will be hard work for educational publishers. At the point of this writing, most state textbook adoptions do not yet allow for iterative, subscription-based content, and most educational publishers are too fearful of failing to gain ROI to fund the development of a large-scale service-based game model.

The question, then, is not only how to build the best immersive online educational model proposal, but also how to market it on two levels—first, to a group that can fund its development, and secondly, to the end users in the sphere of public education. Without a solid and eminently

convincing plan for both parts of this equation, a mass-market educational game will fail in the end. There is one potential solution to this issue, as proposed in the 2010 *NETP* report, which calls for the formation of a government institution dedicated to the development and testing of educational technologies. This institution, tentatively called by the less-than-inspirational name of the National Center for Research in Advanced Information and Digital Technologies (NCRAIDT), would not only test, but also build immersive educational technology. As the *NETP* report states, “Through rapid and iterative cycles of design and trial implementation in educational settings, the national center [would be able to] demonstrate the feasibility and early-stage potential of innovative tools, content, and pedagogies that leverage knowledge, information, and technology advances” (76). Positioned at a cross-point between the sources of funding and the end-users, the prospective NCRAIDT could be an ideal solution.

The third set of high-level practical questions refers to the target market and discipline, and may quite easily tie back into the question of funding. While there is widespread support for technology application, not all disciplines are considered equal. In 2009, for example, the President’s Council of Advisors on Science and Technology (*PCAST*) was asked to develop “specific recommendations concerning the most important actions that the administration should take to ensure that the United States is a leader in STEM education in the coming decades” (*PCAST* vii). The council’s conclusions, released in a 2010 executive report, call for increased funding specifically in the areas of science, technology, engineering, and math education. Moreover, the proposed solution is more uniquely digital, with a focus on “active investments in research and development to create broadly useful technology platforms and well-designed and validated examples of comprehensive, integrated ‘deeply digital’ instructional materials” (*PCAST* ix). While *PCAST* is obviously biased in their recommendations, that does not make them any less likely to get a disproportionately large

chunk of government funding. As a whole, mathematics and the sciences are easier to leverage support for, whether from STEM or other sources. The folk art focus of Folkvine would be an uphill battle in a widespread adoption run targeted at government funding and K-12 adoptions. I write this from the position of a student and ardent supporter of the humanities. I believe social studies, art, and music should be no less a part of online education worlds than the hard sciences, but that may not be the place to start. However, this does not mean the arts and humanities cannot be incorporated later, particularly in a beta model. *Dimension U* provides an excellent example of how this goal can be accomplished. *Tabula Digita* began first as a middle-school algebra game and only later, after years of work and small gains, was able to transition into science and literacy. History came even later.

Even with these questions answered and the five mandates met, however, the success of a new educational MMORPG is far from guaranteed. From a 2010 perspective, we are failing as a nation to provide a cohesive and visionary application for online learning. In a world of No Child Left Behind, an economic crisis in the U.S., and the increasing departure of jobs to India and China, the true end of the American public education system is fast become reactive rather than proactive. The immediate goal of the U.S. administration, and the true motivation behind No Child Left Behind, and more recent teacher-accountability legislation (such as Florida's recently-vetoed SB6), is the somewhat panic-ridden idea that the nation is falling too far behind to remain competitive in the new global economy. This crisis has arisen partly because of the falling rank of the United States educational system relative to that of the developed world—*PCAST* noted that “international comparisons of our students’ performance in science and mathematics consistently place the United States in the middle of the pack or lower. On the National Assessment of Educational Progress, less than one-third of U.S. eighth graders show proficiency in math and science” (2). At the same time, I would bet that these students go home every day and play video games that require creative

problem-solving skills tied to both math and the sciences, and that they do so with a high level of engagement and creativity.

It is quite possible that the near-future implementation of an immersive MMORPG model like the one I have proposed will be impossible. Instead, individual private companies may continue experimentation with aspects of the model, creating small spinoff games that address some, but not all, of the rules set out here. It is further possible that by the time all school systems are fully equipped to embrace an immersive solution—in terms of both fiscal and political evolution—the rules I have set out will have entirely changed. If there is one thing that I have learned over the course of this dissertation, it is that modern technology is morphing and changing almost as fast as the sociopolitical situation is destabilizing. The best-case scenario right now may not be the same as it is next year, or next decade. Some basic truths may stay the same—for example, the appeal of self-navigated narrative landscapes—but the rapidly-changing face of the modern world assures us only that there are few certainties. Still, this uncertainty does not change the fact that the current strategies in the U.S. education system are in grave need of re-imagining. Today, one of the most promising aspects of online games—their ability to bring together national and international groups in collaborative learning models—is lost in the fragmented market mode of badly-funded educational games. We must now start to seriously and devotedly re-envision our educational models. Is it possible to build a game that students want to play *because of* its strong pedagogical content and theoretical backing? I fervently hope the answer to this question will be yes.

REFERENCES

- “About QA.” *Quest Atlantis Blog*. Indiana University, *n.d.* Web. 6 Oct. 2010.
<<http://questatlantisblog.org/about-qa/>>.
- “Aegis Wing.” *Xbox Live*, *n.d.* Web. 6 Oct. 2010. <<http://www.xbox.com/en-US/games/a/aegiswingxboxlivearcade/>>.
- Allen, Michael. *Michael Allen’s Guide to eLearning: Building Interactive, Fun, and Effective eLearning Programs for Any Company*. Hoboken: John Wiley and Sons, 2003. Print.
- Anderson, Craig. “Violent Video Games: Myths, Facts, and Unanswered Questions.” *American Psychological Association*. 2003. Web. 6 Oct. 2010.
<<http://www.apa.org/science/about/psa/2003/10/anderson.aspx>>.
- “Apple Classrooms of Tomorrow, Today: Learning in the 21st Century.” *ACOT²*, Apr. 2008. Web. 6 Oct. 2010. <<http://ali.apple.com/acot2/curriculum/#linkages>>.
- Arnseth, Hans Christian. “Learning to Play or Playing to Learn—a Critical Account of the Models of Communication Informing Educational Research on Computer Gameplay.” *Game Studies: The International Journal of Computer Game Research*. 6.1 (2006). Web. 6 Oct. 2010 < <http://www.gamestudies.org/0601/articles/arnseth> >.
- Au, Wagner James. “Move Over Myspace, Gaia Online Is Here.” *GigaOM*, 22 Apr. 2007. Web. 6 Oct. 2010. <<http://gigaom.com/2007/04/22/move-over-myspace-gaia-online-is-here/>>.
- . “Inside World of Warcraft Gold Farm, Future of Work.” *GigaOM*, 26 Nov. 2006. Web. 6 Oct. 2010. <<http://gigaom.com/2006/11/26/world-of-warcraft-gold-farmers/>>.

- Babones, Salvatore J. "Trade Globalization, Economic Development, and the Importance of Education-as-Knowledge." *Journal of Sociology* 46.1 (2010): 45-61. *Academic Search Premier*. EBSCO. Web. 13 Nov. 2010.
- Baets, Walter R.J and Gert Van Der Linden. *Virtual Corporate Universities*. Kluwer Academic Publishers: London, 2003. Print.
- Barab, Sasha, *et al.* "Making Learning Fun: Quest Atlantis, A Game Without Guns." *Educational Research & Development* 53.1 (2005): 86-107. Print.
- Barab, Sasha, *et al.* "Our Designs and the Social Agendas They Carry." *Journal of the Learning Sciences* 16:2 (2007): 263-305. Print.
- Barab, Sasha, Scott Warren, and Adam Ingram-Goble. "Academic Play Spaces: Tensions in Designing Games for Classrooms." *Proceedings of the Annual Conference of the American Educational Research Association, San Francisco*. AERA, 14 March 2006. Web. 10 Oct. 2010. <<http://www.scottjwarren.com/aps18-shorter.pdf>>.
- Barab, Sasha, Melissa Gresalfi, and Anna Arici. "Why Educators Should Care About Games." *Educational Leadership*. 67.1 (2009): 76-80. Print.
- . "Research Blog." *Quest Atlantis*. Indiana University, *n.d.* Web. 6 Oct. 2010. <http://inkido.indiana.edu/barab/rsrch_qa.html>.
- Baron, Dennis. "The iPad: What is a Gutenberg Moment, Anyway?" *The Web of Language*. The University of Illinois at Urbana-Champaign, 6 Apr. 2010. Web. 6 Oct. 2010. <<https://illinois.edu/db/view/25/25206>>.
- Barzun, Jacques. *The House of Intellect*. New York: Harper Collins, 2002. Print.
- Bateman, Chris. "Why There Are No Great Game Stories." *Only a Game*, 25 Mar. 2008. Web. 6 Oct. 2010. <http://onlyagame.typepad.com/only_a_game/2008/03/why-there-are-

n.html>.

Baudrillard, Jean. *Simulacra and Simulation*. Trans. Sheila Faria Glaser. Ann Arbor: University of Michigan Press, 1994. Print.

Baumann, Michael. "Google Joins Movement for 'Internet of Things.'" *eContent*. 33.2 (2010): 12. Print.

Bente, Gary *et al.* "Avatar-Mediated Networking: Increasing Social Presence and Interpersonal Trust in Net-based Collaborations." *Human Communication Research* 34.2 (2008): 287-318. Print.

Birkerts, Sven. "Into the Electronic Millennium." *The Gutenberg Elegies*. Faber & Faber: Massachusetts, 1994. Print.

Bulik, Beth Snyder. "Tots Join Tweens in Digital Realm." *Advertising Age* 80.2 (2009): 12. *Academic Search Premier*. EBSCO. Web. 13 Nov. 2010.

California Office of the Governor. "Governor Holds Press Conference With Education Officials Regarding Digital Textbooks Initiative." State of California, 8 June 2009. Web 6 Oct. 2010. <<http://gov.ca.gov/speech/12462/>>.

Cashmore, Pete. "Next Year's Twitter? It's Foursquare." *CNN*, 19 Nov. 2009. Web. 6 Oct. 2010. <<http://edition.cnn.com/2009/TECH/11/19/cashmore.foursquare/>>.

Chapman, Lauren, Jessica Masters, and Joseph Pedulla. "Do Digital Divisions Still Persist in Schools?" *Journal of Education for Teaching*. 36.2 (2010): 239-249.

Christensen, Clayton, Curtis W. Johnson, and Michael B. Horn. *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New York: McGraw-Hill, 2008. Print.

- Cohen, Peter. "Dimenxian." *MacWorld*, 30 Nov. 2006. Web. 6 Oct. 2010.
 <<http://www.macworld.com/reviews/product/405447/review/dimenxian.html>>.
- Congdon, Kristen. "Folkvine: Art and Artists on the Web." *Folkvine Post: Section C*, 2005. Web.
 6 Oct. 2010. <http://folkvine.ucf.edu/news_c1.html#congdon>.
- Corbett, Sara. "Learning By Playing: Video Games in the Classroom." *New York Times*, 15 Sept.
 2010. Web. 6 Oct. 2010. <http://www.nytimes.com/2010/09/19/magazine/19video-t.html?_r=1>.
- "Creative Expression." *Quest Atlantis*. Indiana University, n.d. Web. 6 Oct. 2010.
 <<http://inkido.indiana.edu/barab/sc/ce/index.html>>.
- "Darfur Is Dying." *MtvU*, n.d. Web. 6 Oct. 2010. <<http://www.darfurisdying.com/>>.
- Deleuze, Gilles, and Felix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Trans.
 Brian Massumi. Minneapolis: University of Minnesota Press, 1987. Print.
- Denzin, Norman. "Performance Texts." *Representation and the Text: Re-Framing the Narrative
 Voice*. Ed. William Tierney and Yvonna S. Lincoln. Albany: State University of New
 York Press, 1997. 179-218. Print.
- Deslatte, Melinda. "LA School Funding Formula Short \$42 Million." WWLTV Eyewitness
 News, 15 Nov. 2010. Web. 16 Nov. 2010. <<http://www.wwltv.com/news/La-school-funding-formula-short-42M-108211329.html>>
- De Vries, Bregje, Hans van der Meij, and Ard Lazonder. "Supporting Reflective Web Searching
 in Elementary Schools." *Computers in Human Behavior*. 24.3 (2008): 649-665. Print.
- Dobson, Jason. "Another Dimenxian: Tabula Digita On The New Action Arithmetic Wave."
Serious Games Source, n.d. Web. 6 Oct. 2010. <http://seriousgamesource.com/features/feature_041406_dimenxian.php>.

- "E-Learning." *Wikipedia, The Free Encyclopedia*. Wikimedia Foundation, Inc, 1 Oct. 2010. Web. 6 Oct. 2010. <<http://en.wikipedia.org/wiki/Elearning>>.
- Evans, Stephanie. *Mystory: Brain Spasms*. n.p, n.d. Web. 6 Oct. 2010 <<http://www.clas.ufl.edu/users/glue/s01/sevans2/>>.
- "Eye Tracking Studies: More Than Meets the Eye." *The Official Google Blog*, 2 June 2009. Web. 6 Oct. 2010. <<http://googleblog.blogspot.com/2009/02/eye-tracking-studies-more-than-meets.html>>.
- "Fetishized." *The Free Dictionary*. Farlex, n.d. Web. 6 Oct. 2010. <<http://www.thefreedictionary.com/fetishized>>.
- "Folkvine Unveils New Site." *Folkvine Post: Section B*. Folkvine, 2005. Web. 6 Oct. 2010. <http://folkvine.ucf.edu/news_b1.html#richardson>.
- Franco, Guillermo. "What Is the Future of Text Online?" *Poynter Online*, 23 Mar. 2007. Web. 6 Oct. 2010. <http://www.poynter.org/content/content_view.asp?id=119978>.
- "Game Ratings and Descriptor Guide." *Entertainment Software Rating Board (ESRB)*, n.d. Web. 6 Oct. 2010. <http://www.esrb.org/ratings/ratings_guide.jsp>.
- Garrison, D.R, and Terry Anderson. *ELearning in the 21st Century: A Framework for Research and Practice*. New York: Routledge Falmer, 2003. Print.
- Garrison, Randy, Terry Anderson, and Walter Archer. "Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education." *The Internet and Higher Education*. 2.2 (1999): 87-105. Print.
- Gee, James. *What Video Games Have to Teach Us About Learning and Literacy*. Hampshire: Palgrave McMillan, 2003. Print.

Gee, James, and Michael Levine. "Welcome to Our Virtual Worlds." *Educational Leadership*. 66.6 (2009): 48-52. Print.

Gillen, Martina. "Managing Virtual Communities: Time to Turn to the Whetstone?" *International Review of Law, Computers, & Technology*. 21.3 (2007): 211-220. Print.

"Got Game? Tabula Digita and New York City Schools Team Up For Multiplayer Educational Tournament." *Dimension U*, 13 Dec. 2007. Web. 6 Oct. 2010.

<<http://www.dimensionu.com/dimu/home/Articles.aspx?pressnews=51&ref=content%20news>>.

Great Piggy Bank Adventure. Disney and T. Rowe Price, 2010. Web. 6 Oct. 2010.

<<http://piggybank.disney.go.com/media/ap/piggybank/index.html>>.

Greenfield, Patricia M. "Technology and Informal Education: What Is Taught, What Is Learned."

Science (2009): 69-71. *Academic Search Premier*. EBSCO. Web. 13 Nov. 2010.

Gruber, Howard. "The Image of Wide Scope." *n.p, n.d.* Web. 6 Oct. 2010

<<http://www.clas.ufl.edu/users/glue/fall97/image.html>>.

Hancock, Peter, et al, eds. *Human Factors in Simulation and Training*. Boca Raton: Taylor and Francis Group, 2009. Print.

Haraway, Donna. *Modest_Witness@Second_Millennium.FemaleMan_Meets_OncoMouse:*

Feminism and Technoscience. New York: Routledge, 1997. Print.

Hersh, Richard H. "A Well-Rounded Education for a Flat World." *Educational Leadership* 67.1

(2009): 51-53. *Academic Search Premier*. EBSCO. Web. 13 Nov. 2010.

Hitch, Leslie, and Jim Duncan. "Games in Higher Ed: When Halo 2, Civilization IV, and Xbox 360 Come to Campus." *Educause Committees*, 15 Aug. 2005. Web. 6 Oct. 2010.

<<http://net.educause.edu/ir/library/pdf/DEC0503.pdf>>.

- Hoffman, Donna, and Thomas Novak. "Bridging the Racial Divide on the Internet." *Science*. 280.5362 (1998). 390-391. Print.
- Hooper, Simon. "Web Users Skeptical About Paying for Content." *CNN: World Business*, 7 May 2009. Web. 6 Oct. 2010. <<http://www.cnn.com/2009/BUSINESS/05/08/web.content/index.html>>.
- "Introducing Dimension U Games." *Dimension U Marketing Pamphlet*, 2010. Web. 6 Oct. 2010. <<http://www.dimensionu.com/assets/resources/dimensionu%20introduction%20flyer.pdf>>.
- "ITU Internet Reports: The Internet of Things." *International Telecommunications Union*, 2005. Web. 6 Oct 2010.
- Jiménez, Nicario. "The Past." Folkvine, *n.d.* Web. 6 Oct. 2010. <<http://www.folkvine.ucf.edu/jimenez/past/cajonsanmarcos.html>>.
- "Join QA." *Quest Atlantis Blog*. Indiana University, *n.d.* Web. 6 Oct. 2010. <<http://questatlantisblog.org/join-qa/>>.
- Katsaros, Alex. "Approaching the Production of Folkvine.org" *Folkvine Post: Section C*. Folkvine, 2005. Web. 6 Oct. 2010. <http://folkvine.ucf.edu/news_c1.html>.
- Kay, Alan. "Doing with Images Makes Symbols." Speech. *n.p.*, 31 Dec. 1987. Google Videos. 6 Oct. 2010. <<http://video.google.com/videoplay?docid=-533537336174204822#>>.
- . "User Interface: A Personal View." *The Art of Human-Computer Interface Design*. Ed. Brenda Laurel. Addison-Wesley, Reading, MA, 1990. 191- 208. Print.
- Kincheloe, Joe. "Fiction Formulas: Critical Constructivism and the Representation of Reality." *Representation and the Text: Re-Framing the Narrative Voice*. Ed. William Tierney and Yvonna S. Lincoln. Albany: State University of New York Press, 1997. 57-80. Print.

- Kingsbury, Alex, and Lindsey Galloway. "Textbooks Enter the Digital Era." *U.S. News & World Report*. 141.14 (2006): 63-65. Print.
- Lanier, Jaron. "Digital Maoism: The Hazards of the New Online Collectivism." *Edge: The Third Culture*, 30 May 2006. Web. 6 Oct. 2010. <http://www.edge.org/3rd_culture/lanier06/lanier06_index.html>.
- Larreamendy-Joerns, Jorge, and Gaea Leinhardt. "Going the Distance With Online Education." *Review of Educational Research* 76.4 (2006): 567-605. Print.
- Lee, Dave. "Girl Gamers Still Being Left Out." *BBC*, 6 Aug. 2010. Web. 6 Oct. 2010. <<http://www.bbc.co.uk/news/technology-10883404>>.
- Lincoln, Yvonna S. "Self, Subject, Audience, Text: Living at the Edge, Writing in the Margins." *Representation and the Text: Re-Framing the Narrative Voice*. Ed. William Tierney and Yvonna S. Lincoln. Albany: State University of New York Press, 1997. 37-56. Print.
- Lorenzetti, Jennifer. "How eLearning is Changing Higher Education: A New Look" *Distance Education Report* 9.15 (2005): 4-7. Print.
- Maath. "Rebuilding Ander City." *Quest Atlantis Blog*. Indiana University, 23 June 2010. Web. 6 Oct. 2010. <<http://questatlantisblog.org/2010/06/rebuilding-ander-city/>>.
- Malamed, Connie. "The Small Print: Writing UI Instructions." *UX Magazine*, 17 May 2010. Web. 6 Oct. 2010. <<http://www.uxmag.com/design/the-small-print-writing-ui-instructions>>.
- Manzo, Kathleen. "California State Board Heeds Hindu Groups' Text Concerns." *Education Week*. 25.27 (2006): 22. Print.
- McLuhan, Marshall. *Understanding Media: The Extensions of Man*. Cambridge: MIT Press, 1994. Print.

- Meredith, Robyn. *The Elephant and the Dragon: The Rise of India and China and What it Means for All of Us*. New York: W.W. Norton and Company, 2007. Print.
- Merrill, David. "A Task-Centered Instructional Strategy." *The Journal of Research on Technology in Education*. 40.1 (2007): 5-22. Print.
- "Mission Statement." *360ED*, n.d. Web. 6 Oct. 2010. <<http://www.360ed.com/company/#>>.
- Mordaine. "Blizz, Plz Make Worgen Horde." *World of Warcraft Forums*, 21 Aug. 2009. Web. 6 Oct. 2010. <<http://forums.worldofwarcraft.com/thread.html?topicId=19382692123&sid=1>>.
- Newman, Frank, and Jamie Scurry. "Online Technology Pushes Pedagogy to the Forefront." *Chronicle of Higher Education* 47.44 (2001): B7-B9. Print.
- Nichols, Mark. "A Theory for eLearning." *Educational Technology & Society*. 6.2 (2003): 1-10.
- "Northrend Rare Mob Hunting." *World of Warcraft Strategies*. Master of Warcraft, 13 Jan. 2010. Web. 6 Oct. 2010. <<http://www.masterofwarcraft.net/2010/01/northrend-rare-mob-hunting.html>>.
- "OLPC Mission." *One Laptop Per Child*. OLPC, n.d. Web. 6 Oct. 2010. <<http://laptop.org/en/vision/mission/index.shtml>>.
- Oppenheimer, Todd. *The Flickering Mind*. New York: Random House, 2003. Print.
- O'Reilly, Tim. "What is Web 2.0?" *O'Reilly Media*, 30 Sept. 2005. Web. 6 Oct. 2010. <<http://oreilly.com/web2/archive/what-is-web-20.html>>.
- Park, Eddie. "MWSF: Tabula Digita's Dimenxian." *Inside Mac Games*, 12 Jan. 2006. Web. 6 Oct. 2010. <<http://www.insidemacgames.com/news/story.php?ArticleID=12694>>.

- “Part I: Answers to Questions About Video Games and Learning.” *The Learning Network: Teaching and Learning with the New York Times*, 20 Sept. 2010. Web. 15 Oct. 2010. <<http://learning.blogs.nytimes.com/2010/09/20/part-i-answers-to-questions-about-video-games-and-learning/>>.
- Pigna, Kris. “‘World of Warcraft’ Costs Just \$200 Million.” *PCMag*, 16 Sept 2008. Web. 6 Oct. 2010. <<http://www.pcmag.com/article2/0,2817,2330507,00.asp>>.
- “Plague World: A Modern Prometheus.” *Quest Atlantis*. Indiana University, Web. 6 Oct. 2010. <http://worked_examples.crlt.indiana.edu/projects/7>.
- President’s Council of Advisors on Science and Technology (PCAST)*. “Executive Report.” U.S. Department of Education, Sept. 2010. 6 Oct. 2010. <<http://www.whitehouse.gov/administration/eop/ostp/pcast/docsreports>>.
- “Quest Atlantis: Legend.” *Quest Atlantis*. Indiana University, *n.d.* Web. 6 Oct. 2010. <<http://atlantis.crlt.indiana.edu/site/view/Questers#26>>.
- “Quest Atlantis: Research.” *CLRT*. Indiana University, *n.d.* Web. 6 Oct. 2010. <<http://crlt.indiana.edu/research/qa.html>>.
- Quillen, Ian. “Textbook Publisher Unveils \$100M Innovation Fund.” *Education Week*, 13 Sept. 2010. Web. 6 Oct. 2010. <http://blogs.edweek.org/edweek/DigitalEducation/2010/09/ed_publishing_giants_unveil_10.html>.
- . “Wanted: Social Networking Policy to Match Potential.” *Education Week*, 9 Sept. 2010. Web. 6 Oct. 2010. <http://blogs.edweek.org/edweek/DigitalEducation/2010/09/wanted_social_networking_polic.html>.

- Ravitch, Diane. "The Myth of Charter Schools." *The New York Review of Books*, 11 Nov. 2010. Web. 12 Nov. 2010. <<http://www.nybooks.com/articles/archives/2010/nov/11/myth-charter-schools/?pagination=false>>.
- Riedel, Chris. "UCF Study Finds Video Games Increase Student Achievement." *THE Journal*, 16 June 2008. Web. 6 Oct. 2010. <<http://thejournal.com/articles/2008/06/16/ucf-study-finds-video-games-increase-student-achievement.aspx>>.
- Ripley, Amanda. "Is Cash the Answer?" *Time*. 175.15 (2010): 40-47.
- Robinson, Ken. "Ken Robinson says schools kill creativity." Speech. Feb. 2006. Ted Conferences. 6 Oct. 2010. <http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity.html>.
- Roder, Tabitha, and Tom Parker. "Volunteers Report—Samoa OLPC Deployments Visit." OLPC, August 2010. Web. 10 Nov. 2010. <http://wiki.laptop.org/images/0/0a/Volunteers_report_August_2010_-_olpc_Samoa_deployments.pdf>.
- Rosen, Judith. "Poptropica: Online Publisher For Kids." *Publishers Weekly* (2009): 6. *Professional Development Collection*. EBSCO. Web. 14 Nov. 2010.
- "Rule 34." *Urban Dictionary*, n.d. Web. 6 Oct. 2010. <<http://www.urbandictionary.com/define.php?term=Rule%2034>>.
- Salen, Katie, et al. "Quest to Learn: Developing the School for Digital Kids." *The John D. and Catherine T. Macarthur Foundation*, n.d. Web. 6 Oct. 2010. <<http://q2l.org/node/27#media>>.
- Saper, Craig. "Toward A Visceral Scholarship Online: Folkvine.org and Hypermedia Ethnography." *E-Media Studies*. 1.1 (2008). Web. 6 Oct. 2010.

<<http://journals.dartmouth.edu/cgi-bin/WebObjects/Journals.woa/2/xmlpage/4/article/285>>.

Schoback, Kathy. "The Economics of a Next-Gen Game." Online PowerPoint. *International Game Developer's Association*, 25 Oct. 2006. Web. 6 Oct. 2010.

<archives.igda.org/biz/GDC05_NextGenEconomics.ppt>.

"School Principals and Social Networking in Education: Practices, Policies, and Realities in 2010." *edWeb.net, IESD, Inc., MMS Education, and MCH, Inc*, 9 Sept. 2010. Web. 6 Oct. 2010. <<http://www.edweb.net/edWebNews>>.

Schrader, P.G., and McCreery, Michael. "The Acquisition of Skill and Expertise in Massively Multiplayer Online Games." *Educational Technology Research and Development*. 56.5-6 (2008): 557-574. Print.

Sewall, Gilbert. "Digital Textbooks: They're Coming, But Will They Be Better?" *Education Week* 29.28 (2010): 44, 34.

Sharkey, Mike. Interview by Gerry Bayne. "Instructional Technologies at the University of Phoenix." *Educause*, 19 Mar. 2009. Web. 6 Oct. 2010. <<http://www.educause.edu/blog/gbayne/E08PodcastInstructionalTechnol/16817>>.

Shields, Mike. "Avatar Nation: New Virtual Worlds Attracting Young Demos." *MediaWeek*, 3 Dec. 2007. Web. 6 Oct. 2010. <http://www.mediaweek.com/mw/eseach/article_display.jsp?vnu_content_id=1003679922>.

Sloman, Martyn. *The ELearning Revolution: How Technology is Driving a New Training Paradigm*. New York: American Management Association, 2002. Print.

"Social Responsibility." *Quest Atlantis*. Indiana University, n.d. Web. 6 Oct. 2010. <<http://inkido.indiana.edu/barab/sc/sr/index.html>>.

- Solochek, Jeffrey. "At Florida Virtual School, History is Taught Through Gaming." *St. Petersburg Times*, 2 Nov. 2009. Web. 6 Oct. 2010. <
<http://www.tampabay.com/news/education/k12/at-florida-virtual-school-history-is-taught-through-gaming/1048726>>.
- "Spreading the Story and Spirit of Art and Artists." *Folkvine Post: Section A*. Folkvine, 2005. Web. 6 Oct. 2010. <http://folkvine.ucf.edu/news_a1.html>.
- Stansbury, Meris. "Florida Adopts Open-Content Reading Program." *eSchool News*, 24 Jan. 2008. Web. 6 Oct. 2010 <<http://www.eschoolnews.com/2008/01/24/florida-adopts-open-content-reading-platform/>>.
- Steinberg, Scott. "What Does 'Video Game' Mean, Anyway?" *CNN*, 8 Aug. 2010. Web. 6 Oct. 2010. <<http://www.cnn.com/2010/TECH/gaming.gadgets/08/08/video.games.steinberg/index.html?hpt=Mid>>.
- Steinbock, Dan. *Winning Across Global Markets: How Nokia Creates Strategic Advantage in a Fast-Changing World*. San Francisco: Jossey-Bass, 2010.
- Story, Louise. "Shift Away From Ad-Free Has a Price." *New York Times*, 13 Dec. 2007. Web. 6 Oct. 2010. <<http://www.nytimes.com/2007/12/13/business/media/13adco.html>>.
- "Study: Geography Greek to Young Americans." *CNN Politics*, 4 May 2006. Web. 6 Oct. 2010. <http://articles.cnn.com/2006-05-02/politics/geog.test_1_map-geographic-knowledge-young-people?_s=PM:EDUCATION>.
- Sutcliffe, Alistair, Sri Kurniawan, and Jae-Eun Shin. "A Method and Advisor Tool for Multimedia User Interface Design." *International Journal of Human-Computer Studies*. 64. 4 (2006): 375-392. Print.

- Sutter, John. "Can People Actually 'Own' Virtual Land?" *CNN*, 10 May 2010. Web. 6 Oct. 2010. <<http://www.cnn.com/2010/TECH/05/10/virtual.property.second.life/index.html>>.
- Swaim, Michael. "12 Great Video Games With Ridiculous Premises." *Cracked*, 6 June 2007. Web. 6 Oct. 2010. <http://www.cracked.com/article_15227_12-great-video-games-with-ridiculous-premises.html>.
- Tapscott, Don, and Anthony Williams. *Wikinomics: How Mass Collaboration Changes Everything*. New York: Portfolio, 2006.
- "Teachers' Use of Educational Technology in U.S. Public Schools: 2009." U.S. Department of Education, May 2010. Web. 6 Oct. 2010. <<http://www2.ed.gov/about/offices/list/oea/technology/index.html>>.
- Thevenot, Brian. "Legislation Promotes Growth of Digital Textbooks." *The Texas Tribune*, 6 Nov. 2009. Web. 6 Oct. 2010. <<http://www.texastribune.org/texas-education/public-education/legislation-promotes-growth-of-digital-textbooks/>>.
- "TLDR." *Know Your Meme*. n.p, n.d. Web. 6 Oct. 2010. <<http://knowyourmeme.com/memes/tldr>>.
- Tolmie, Andrew, *et al.* "Social Effects of Collaborative Learning in Primary Schools." *Learning & Instruction*. 20.3 (2010): 177-191. Print.
- Toppo, Greg. "Free Online Materials Could Save Schools Billions." *USA Today*, 6 Nov. 2007. Web. 6 Oct. 2010. <http://www.usatoday.com/news/education/2007-11-06-freereading_N.htm>.

- Trager, Cara. "Die! Die! Die, Boring Homework!" *Crains New York Business: Top Entrepreneurs 2010*, Web. 6 Oct. 2010. <http://mycrains.crainsnewyork.com/small_business_awards/profiles/2010/215>.
- "Trailer." *Dimenxian*. 2006. YouTube, *n.d.* Web. 6 Oct. 2010. <<http://www.youtube.com/watch?v=OSwfxccGAcY>>.
- Tutton, Mark. "Learn the Five Secrets of Innovation." *CNN*, 1 Dec. 2009. Web. 6 Oct. 2010. <<http://edition.cnn.com/2009/BUSINESS/11/26/innovation.tips/index.html>>.
- Ulmer, Gregory. *Internet Invention: From Literacy to Electracy*. New York: Longman, 2003. Print.
- United States. *National Educational Technology Plan (NETP) 2010*. U.S. Department of Education, 2010. Web. 6 Oct 2010. <<http://www.ed.gov/sites/default/files/NETP-2010-final-report.pdf>>.
- United States. *STEM Workforce Challenge*. U.S. Department of Education, 2007. Web. 6 Oct. 2010. <http://www.doleta.gov/Youth_services/pdf/STEM_Report_4%2007.pdf>.
- United States. "The Facts About Measuring Progress." U.S. Department of Education, 7 June 2005. Web. 6 Oct. 2010. <<http://www2.ed.gov/nclb/accountability/ ayp/testing.html>>.
- "User Testimonials: HMH Fuse" *Houghton Mifflin Harcourt Education*, *n.d.* Web. 6 Oct. 2010. <<http://hnheducation.com/fuse/algebra1/pilot-3.php>>.
- "Video Games In Schools to Help Millions of Students Improve Math Skills." *Dimension U*, 21 Jan. 2009. Web. 6 Oct. 2010. <<http://www.dimensionu.com/dimu/home/Articles.aspx?pressnews=32&ref=content%20news>>.
- Wauters, Robin. "Does Anybody Still Use Second Life? And If So, How Much Is It

- Worth Today?" *TechCrunch*, 2 July 2009. Web. 6 Oct. 2010.
<<http://techcrunch.com/2009/07/02/does-anybody-still-use-second-life-and-if-so-how-much-is-it-worth-today/>>.
- Weinberger, David. *Everything is Miscellaneous: The Power of the New Digital Disorder*. New York: Times Books, 2007.
- Weir, Rob. "They Don't Read!" *Inside Higher Ed*. 13 Nov. 2009. Web. 10 Nov. 2010.
<http://www.insidehighered.com/advice/instant_mentor/weir16>.
- Winograd, David. "HMH Fuse: California Tests a Full Year Algebra Course on an iPad App." *TUAW*, 14 Sept. 2010. Web. 6 Oct. 2010. <<http://www.tuaw.com/2010/09/14/hmh-fuse-california-tests-a-full-year-algebra-course-on-an-ipad/>>.
- Williams, Dmitri, Nicole Martins, Mia Consalvo, and James Ivory. "The Virtual Census: Representations of Gender, Race, and Age in Video Games." *New Media & Society*. 11.5 (2009): 815-834. Print.
- Williams, Peter John. "Valid Knowledge: The Economy and the Academy." *Higher Education*. 54.4 (2007): 511-523.
- Wong, David. "5 Creepy Ways Video Games are Trying To Get You Addicted." *Cracked*, 8 Mar. 2010. Web. 6 Oct. 2010. <http://www.cracked.com/article_18461_5-creepy-ways-video-games-are-trying-to-get-you-addicted.html>.
- Yee, Nick. "The Demographics, Motivations, and Derived Experiences of Users of Massively Multi-User Online Graphical Environments." *Presence: Teleoperators & Virtual Environments*. 15.3 (2006): 309-329. Print.
- Yee, Nick, and Jeremy Bailenson. "Walk A Mile in Digital Shoes: The Impact of Embodied Perspective-Taking on The Reduction of Negative Stereotyping in Immersive Virtual

Environments.” *Proceedings of PRESENCE 2006: The 9th Annual International Workshop on Presence*, n.d. Web. 10 Oct. 2010.

<[http://www.nickyee.com/pubs/Yee%20&%20Bailenson%20-%20Digital%20Shoes%20\(2006\).pdf](http://www.nickyee.com/pubs/Yee%20&%20Bailenson%20-%20Digital%20Shoes%20(2006).pdf)>.

Zheng, Dongping, Michael Young, Manuela Wagner, and Robert Brewer. “Negotiation for Action: English Language Learning in Game-Based Virtual Worlds.” *The Modern Language Journal*. 93.4 (2009): 489-511. Print.