The U.S. military is undergoing a major cultural shift in its approach to education and training. The technological skills and experience—gained largely through computer games and Web surfing—of the young people joining the military today, as well as the incredible capabilities of commercial computer games, have led to what Michael Macedonia, chief scientist and technical director of the U.S. Army Simulation, Training, and Instrumentation Command (STRICOM), describes as the emergence of a military culture that accepts computer gaming as a powerful tool for teaching, socialization, and training. J.C. Herz, chief executive officer of Joystick Nation, Inc., discusses how higher education might in a similar fashion strengthen and enrich students’ learning experiences by leveraging the possibilities inherent in the networked cooperative interaction that underlies enormously popular multiplayer online computer games.
The U.S. military has been interested in commercial computer games for over two decades, beginning with the introduction of Mech War, created by James Dunnigan, into the Army War College curriculum in the late 1970s. More recently, two key factors have raised the visibility and importance of game technology and content to the Department of Defense (DoD) community.

First, simulation technology—that is, the creation of virtual experiences—is now a major strategic capability for the U.S. military. No other country has invested as much in this capability as has the United States. For example, the United States has incorporated war gaming and simulation into the curriculum of every war college and into the operations of every commander-in-chief (CINC) headquarters.

Second, computer modeling and simulation are considered essential to military transformation—the remaking of the armed forces for the new realities of the 21st century. These tools present a powerful means for our military leadership to visualize the future and assess the needs of our new armed forces.

The U.S. military is exploiting commercial entertainment technology and simulation to revolutionize education and training—with dramatic effect. DoD is leveraging the capabilities of commercial products by firms such as IBM, Sony, and Microsoft to take advantage of the huge investments these companies pour into research and development. Microsoft, for example, spent over $2 billion on development of the X-Box alone, far surpassing the U.S. Army’s entire science and technology budget of $1.6 billion.

Strategy and tactics games are particularly popular with the service colleges. For example, the commercial fleet tactics game, Jane’s Fleet Command, is used by the Naval War College. The game was developed by Sonalysts, a defense contractor, which reports that the British Royal Navy has asked for a license to modify the game for its operational planning. The use of such games has become so common that the Air University has for several years sponsored an annual conference called Connections. Connections brings together the military and commercial war-gaming communities for both technical interchange and concept exploration.

For the last two decades, DoD has been using commercial games to develop skills and to build teams. Early on, the army modified Atari’s Battlezone and the marines adapted ID Software’s Doom to teach a variety of skills and concepts. Perhaps the most successful use of commercial games for training has been with Microsoft’s Flight Simulator. The navy now issues a customized version of this software to all its student pilots and all undergraduates enrolled in naval ROTC courses at 65 colleges and universities. Extensive studies have shown that students who use such products tend to perform better in flight training than those who do not. The navy also realized that the majority of its flight training students were using Flight Simulator at home.

Encouraged by the successful application of these and other commercial products, the military is undertaking a number of research efforts to further explore the use of commercial entertainment technology and content for education and training. As discussed at last year’s Forum symposium, the army and DoD have partnered with the University of Southern California to form the Institute for Creative Technologies, which will focus primarily on development of both the technology and the art to create virtual experiences. Their goal is to revolutionize how the military trains and rehearses for upcoming missions. Military leaders expect nothing less than a quantum leap in helping the army to prepare for the world, soldier, weaponry, and mission of the future.
Clearly, the military has embraced the potential of entertainment technology for enhancing teaching and learning. Computer games, particularly online multiplayer role-playing games, illustrate the learning potential of a network and the social ecology that can unlock that potential for colleges and universities.

Today, nearly every strategy and combat game comes with a built-in level editor and tools to create custom characters or scenarios. Nourished by the flexibility of these tools and the innate human desire to compete and collaborate, a dynamic, distributed ecosystem of official game sites, fan pages, player-matching services, and intermediaries flourishes and grows in an unrestrained fashion on a global basis. As the player population expands, so too does the game industry, which now rivals the Hollywood box office, exceeding $7 billion in annual sales.

At every step along the way, gamers have embraced the many-to-many potential of computer networks not just to compete but to collaborate, invent, and construct a networked model for learning and teaching. If a gamer doesn’t understand something, there is a continuously updated, distributed knowledge base maintained by a sprawling community of players from whom he can learn. “Newbies” are schooled by more skilled and experienced players. Far from being every man for himself, multiplayer online games actively foster the formation of teams, clans, guilds, and other self-organizing groups. The constructive capabilities built into games allow players to stretch their experiences in new and unexpected directions, to extend the play value of the game, and in so doing garner status. Customized maps, levels, characters, and game modifications are all forms of social currency that accrue to the creators of such content as it is adopted and shared among players.

In terms of the speed and volume of learning—the rate at which information is assimilated into knowledge and then synthesized into new forms—the networked ecosystem of online gaming is vastly more dimensional than the 19th century paradigm of classroom instruction. Games fully leverage technology to facilitate “edge” activities—the interaction that occurs through and around games as players critique, rebuild, and add onto them, teaching each other in the process. Players learn through active engagement not only with software but with each other as well.

It is widely acknowledged in higher education that much learning happens outside the classroom. But universities have no coherent strategy for leveraging that “edge” activity online. There are online syllabi and course catalogs, threaded discussions that graft section discussions onto threaded message boards, e-mail between students, and sometimes e-mail between students and teachers. But these activities are not integrated in a constructive way—they are not shaped into a socially contextualized learning environment.

To be meaningful, online content should leverage the social ecology that drives networked interaction. An online environment, such as an Internet-only experience or the complement to an off-line course, must give participants the tools to actively engage in construction of their learning experience. If students are challenged to immediately use course content in some way, they and their fellow students can benefit. In this way, the structure of the experience can make students useful to one another. Moreover, the system should acknowledge students’ contributions to the larger learning experience.

“LEVELING UP”

Underlying the dynamics of networked environments is a process whereby individuals are evaluated and rewarded by the system itself, rather than by a specific individual. This process is perhaps most evident in massively multiplayer role-playing games (RPGs) such as Sony’s Everquest or Microsoft’s Asheron’s Call. Unlike most games, whose playing fields exist only while participants are actively engaged, these online worlds persist whether or not an individual player is logged on at any given time.
This sense of persistence gives the game depth and is psychologically magnetic: Players are compelled to return habitually (even compulsively) to the environment lest some new opportunity or crisis arise.

The persistence of the virtual environment allows players to build value. In a role-playing game, a player’s progress is represented not by geographical movement (as in many console adventure games where the object is to get from point A to point B, defeating enemies along the way), but by the development of his character. The player earns experience points by overcoming in-game challenges. At certain milestone point tallies, the character is promoted to a new experience level, gaining access to new tactics and resources—but also attracting more powerful enemies. The better the player becomes, the more daunting the challenges. Thus, the player scales a well-constructed learning curve over several months or years as he builds his level-one character into, for example, a highly skilled, fully equipped level-50 *Everquest* powerhouse.

One’s character is a reflection of every action a player has taken in the virtual environment—a sort of existential self-portrait. Not surprisingly, players are emotionally invested in the statistical profiles of these characters, far more so than they would be in a simple score tally (or grade-point average). In a sense, the RPG game persona is the most fully dimensional representation of a person’s accumulated knowledge and experience in the months and years they spend in an online environment. (On a purely pragmatic level, these virtual personas represent hundreds of hours of invested time, which is why high-level *Everquest* characters sell for thousands of dollars on eBay.)

In a deeply networked learning environment, it is not unreasonable to imagine the mechanisms of evaluation shifting to this model, which in some ways mirrors the principles of a liberal education—that students should, in the course of their undergraduate education, understand the modes of thinking inherent in physical and social sciences, history, literature, philosophy, logic, and the arts. Instead of a binary framework where those requirements are either met or not met, they might be considered attributes that are continuously strengthened, concentrating in the student’s field of study, just as an RPG character’s experience heightens the attributes specific to the in-game profession he has chosen.

In this framework, courses, projects, and extracurricular activities are all experiences that allow a student to incrementally progress along a number of axes, from quantitative analysis, fluency in a foreign language, and aesthetic knowledge, to leadership and communications skill. Depending on the type and difficulty of the challenges students assume and how well they acquit themselves, experience points accrue along these axes.

Leveling up from year to year would in this context reflect more than a certain number of hours of class time and a certain assortment of grades. Unlike a transcript, this persona-based representation of individual performance comes close to representing the sum of a student’s experience along a variety of axes; that is, who they are on the day they graduate rather than what they were doing in the spring semester of their sophomore year. It gives students a means to understand their development as a continuum and how their cumulative achievement reflects both their strengths and the gaps in their development.

This sense of actualized knowledge is the most powerful convention that higher education can borrow from persistent multiplayer online worlds because, after all, life for a 21st century undergraduate is a persistent multiplayer online world.

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