DANIEL BURRUS'
TECHNO TRENDS

THE BIG IDEAS THAT ARE CHANGING EVERYTHING

Gameification: Accelerating Learning with Technology

By Daniel Burrus, CEO of Burrus Research

Anyone who has kids—or who has been around them for any length of time—knows they are attracted to video games like moths to light. You might be tempted to think these kids are using their time idly.

In reality, they're pioneering the future of business training and education.

This is part of a trend I call gameification, which I first identified in the early eighties and is today reaching its tipping point.

Gameification represents part of a predictable sequence. Many of the greatest technological advances in business have come originally from the world of kids and their games. Here's how the sequence flows:

First, an innovative concept or new technology often starts out in the world of games for children. Sometimes it's the military (or in times past, the space program) that serves as the launch point. But it's amazing how often it's kids' games.

From there it sooner or later gains the attention of the adults in the business community as they learn how to adapt and apply it to their needs.

Finally, it creeps into the education sector. Just look at the evolution of social media.

When new social-media sites such as Facebook and Twitter first launched, who were the first to get on board? Young people. Adults didn't see the value. (Who really cares what you had for lunch or what outfit someone wore to the dance?)

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Eventually adults in the business world started seeing how social media could be used for tasks like brand management, marketing, and collaboration, and began embracing the tools their teenage kids had long mastered.

New Thresholds of Interactivity

Social media and video games are very different technologies, but the migration pattern is the same. And with game-controller systems like the Wii and Xbox Kinect giving us radical new ways of interacting with technology, the business world is finally on the threshold of becoming gameified.

In the past, gaming meant sitting passively in front of a computer or television screen and using a game pad, joystick, or keyboard to play against the computer or online opponent. No more. With Nintendo's interactive Wii, players began standing up and getting physically involved in their games. Microsoft's Kinect eliminated the need for a hand-held controller entirely, with players using movements of their hands and bodies to manipulate the game. Thanks to Microsoft's software development kit for the Kinect, university students are writing software that lets users control business software using hand motions alone—no keyboard or mouse. You want to go to the next page? Just sweep your hand in the air, past your screen. Sweep left, sweep right, scroll up, scroll down … Remember in Minority Report how Tom Cruise could maneuver data in the air without touching anything? Science fiction to science fact. Interactive gaming like this will transform the nature of training and education.

Five Core Elements

Based on twenty-five years of research, I've identified five core elements that can dramatically accelerate learning when applied together.

#1 Self Diagnostic: In the world of gaming, the more feats you accomplish, the greater challenges the game gives you. Power down and the game remembers where you left off, so when you return to the game, you don't have to start over from scratch. How much time have you wasted sitting through business trainings that mostly covered things you already knew, just to learn those few key items you didn't? Why not give your business training a self-diagnostic component, like advanced video games?

#2 Interactivity: For centuries education and training have been mostly passive experiences: someone stands in front of the group and talks, and the trainees sit and listen. You might get some hands-on practice in a lab, but that's comparatively rare. In advanced video games you move things around and manipulate items. You interact with the information. You are engaged and immersed—and learning is far more effective when you interact with the material. Why not create an interactive module for your business training?

#3 Immersion: With early 3D technology (including today's 3D movies and 3D televisions) you have to wear special glasses to make the images pop out at you. With newer technology the 3D is interspatial: instead of images popping out at you, you enter them. You become immersed in the information. When you're training salespeople on, say, a particular manufacturing tool they're going to sell, why not have them see the tool in 3D and get to manipulate the tool (virtually) rather than have them read spec sheets about it?

#4 Competition: Humans are naturally competitive. We want to sell more, be more productive, and innovate faster and better than the next person. When you sit in class learning, there's little competitive value. Whether you learn the materials in one hour or three, no one advances until the class is over. When you compete in a game, there's an adrenaline rush that keeps you engaged and focused on the task at hand. In an effort to win, people master concepts faster so they can be first.

#5 Focus: When you play a game, you're forced to focus. You have to do A before B can occur. If you don't focus on doing A, you don't get very far. Focus is enhanced by interactivity, competition, immersion, and self-diagnosis. And when you can focus, you can learn virtually anything—fast.

Accelerate Learning

When you model your company's training to include these five elements, your employees will learn more in less time and have better results. Using all five core elements is the key to accelerating learning. With more and more to learn, it will be increasingly important to gamily both business and education to create better results faster. Since businesses spend large sums of money on training and education, any tool that can accelerate or enhance learning will save both time and dollars. Those companies and school districts that adopt early will be the long-term winners. So here's your homework assignment: Get together with a kid and play one of their games. While you're playing, think about and how you could reinvent learning with tools like these.

TECHNOLOGY NEWS HIGHLIGHTS

White Space: Faster than WiFi

In December, the Federal Communications Commission (FCC) approved a new type of wireless network that promises to bring free Internet access to even the remotest areas. It uses a portion of the broadcast spectrum known as "white spaces" – the unused frequencies between television channels that were opened up when the transition was made from analog to digital TV. Faster than WiFi, white spaces can handle more data, opening up a whole host of new applications (not to mention a need for a new wave of white spaces devices). And because it uses television broadcast signals, it's also less prone to interference. It's been projected that the move to white spaces could represent a multi-billion dollar industry, but before television band devices (TVBDs) can be rolled out, the FCC is setting up a network of nine companies to act as database administrators and ensure that television stations will not be affected by the new technology. The first of these administrators plans to begin operations this month in Wilmington, NC.

For information: Spectrum Bridge, Inc., 1064 Greenwood Blvd., Suite #200, Lake Mary, FL 32746; phone: 866-598-7426 or 407-792-1570; fax: 407-805-3118; Web site: www.spectrumbridge.com

Giant Boost To Moore's law

IBM recently created a new type of computer memory that reduces the number of atoms required to store one bit of data from about one million down to twelve. Traditional memory devices are made of ferromagnetic materials in which atoms line up with the same magnetic polarization. The new method uses a property known as antiferromagnetism, where the atoms are aligned in opposite directions. According to the laws of magnetism, opposites attract, causing the atoms to move closer together. The net result is magnetic memory that is 100 times as dense as today's devices. The technology is still in the development stage – the process currently requires a scanning tunneling microscope at a temperature of one degree Kelvin (-272 degrees Celsius or -458 degress Fahrenheit) in order to control the switching of bits from zeroes to ones and back again. Regardless, it does illustrate that we haven't come close to reaching the ultimate end of Moore's Law.

For information: IBM Corporation, 1 New Orchard Road, Armonk, NY 10504; phone: 914-499-1900; Web site: www.ibm.com

More Efficient Solar

A new development in solar technology was recently announced that boosts performance even further. Basically an improvement on an existing three-layer design, the new cell offers a record conversion efficiency of 36.9 percent. Triple-junction, compound solar cells were introduced about two years ago and consist of three photoabsorption layers – indium gallium phosphide, gallium arsenide and indium gallium arsenide. The improved efficiency was gained by reducing the resistance of the junctions between the layers. New solar cells for use in satellites and other aerospace applications should be ready for commercialization in 2014. The company also plans to develop a version for photovoltaic (PV) power plants that will include a condenser lens.

For information: Sharp Electronics Corporation, Sharp Plaza, Mahwah, NJ 07495-1160; phone: 201-529-8200; fax: 201-529-8425; Web site: www.sharpusa.com/SolarElectricity.aspx

Custom Bones

Rapid prototyping (also known as 3D printing) is already being used to create organs for transplants. Now researchers have found a way to utilize this technology to fabricate customized bones. A printer that is normally used to produce metal parts was modified to "print" a bone-like material. When the resulting structure is placed in a culture with immature bone cells, it acts as a scaffold for new bone cells to grow – a process which takes as little as a week. The new technology could have a tremendous impact on regenerative medicine by allowing clinicians to scan a damaged area and create a perfectly shaped replacement. And because it's made of actual bone rather than metal or ceramic, chances are it will fuse more readily to existing bone.

For information: Susmita Bose, Washington State University, School of Mechanical and Materials Engineering, P. O. Box 642920, Pullman, WA 99164-2920; phone: 509-335-7461; email: sbose@wsu.edu; Web Site: www.wsu.edu

Record-Setting Super Computer

Japanese developers recently announced that "K" – the world's fastest supercomputer – has become the first to surpass the 10 petaflop (10 quadrillion calculations per second) milestone. And it did so with a record execution efficiency of 93.2 percent. The next-generation machine derives its name from "kei," the Japanese word for 10 quadrillion. The scalar-type supercomputer consists of more than 88,000 central processing units (CPUs) that are interconnected in a multi-layer environment. Back in June, it had already been ranked as the fastest supercomputer in the world at 8.16 petaflops. The new record performance of 10.51 petaflops was logged in November while running continuously for more than 30 hours. Researchers are currently working on software that will make full use of K's flexibility and high-connectivity to conduct highly complex simulations for developing everything from new drugs to new nanomaterials. Ultimately, the supercomputer will be connected across Japan's Science Information Network for shared access.

For information: Riken Next-Generation Supercomputer R&D Center, Marunouchi, 6th floor, Meijei Seimei Kan, 2-1-1 Marunouchi, Chiyoda-ku, Tokyo 100-0005, Japan; phone: +81-048-467-9265; fax: +81-03-3216-1883; Web site: www.nsc.riken.jp/project-eng.html

600-Mile Battery

In the quest for a long-range electric vehicle (EV), Toyota has apparently been making headway with the development of a battery that will power a compact EV for over 600 miles. The solid state lithium battery could be ready for commercialization as early as 2015, however, cost is a major unknown as it contains germanium, which is relatively expensive. Another unknown that will greatly impact market acceptance is recharge time. But one thing is certain – the battery market still has plenty of room for disruptive technologies as we move toward the cars of the future.

For information: Toyota Motor Corporation, 1 Toyota-Cho, Toyota City, Aichi Prefecture 471-8571, Japan; phone: +81-0565-28-2121; Web site: www.toyota-global.com

Robot Guards

Starting in March, a new line of robotic prison guards will be tested out at a jail in Pohang, South Korea. Far from the "terminator-style" enforcers people may envision, they even look friendly! Their job is not to crack down on inmates, but to make the work of human guards easier by patrolling corridors and monitoring cells. They are capable of detecting violence and can even recognize suicide attempts. Prisoners can also summon them in the event that they feel sick or threatened. A leader in the robot revolution, South Korea has been using robots for everything from patrolling the North Korean border to teaching English in schools. This newest project, which will cost about $864,000 involves deploying three prototype guard-bots for one month.

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