Video Games

Do they have educational value?

More than three-quarters of American youths have video-game consoles at home, and on a typical day at least 40 percent play a video game. Some academic scholars claim playing games is good for literacy, problem-solving, learning to test hypotheses and researching information from a variety of sources. Others say gaming may be good for understanding technical information but not for reading literature and understanding the humanities. Enthusiasts claim gaming is preparing young people for the knowledge-based workplace. Critics worry that it’s making kids more socially isolated, less experienced in working with others and less creative. Experts remain divided about whether addiction to games is widespread and whether violent games produce violent behavior. Increasingly, researchers are studying why games are so engrossing, and some are urging educators to incorporate games’ best learning features into school programs.
THE ISSUES

• Does playing video games improve literacy?
• Are games addictive?
• Do video games prepare young people for the future job market?

BACKGROUND

Pinball Precursor
The first video game was invented in 1958.

Equity Gap?
The poor have less access to gaming technology.

Gender Gap Narrows
Women over age 18 represent 30 percent of U.S. gamers.

CURRENT SITUATION

Big Business
Video-game sales have nearly tripled in 10 years.

Social Networking
Online games are a popular way for teens to network.

Libraries Log On
Younger librarians say offering video games is part of libraries’ mission.

Saying Less?
Some critics blame video games for declining literacy.

OUTLOOK

Testing the Hypothesis
More research is needed on what’s good, bad about games.

SIDEBARS AND GRAPHICS

Sports and Multiplayer Games Most Popular
The highest-selling games appeal to both males and females.

Most Gamers Are Males
Sixty-two percent of game players are males between 18 and 49.

Gamers Are Not Isolated, Obsessed
The average gamer spends much more time on non-gaming activities.

‘Sims’ Inventor Exploring New Frontiers in Creativity
“Spore” will let players control evolution.

Chronology
Key events since 1958.

Do Video Games Make Kids More Violent?
Research has produced mixed results.

Entering the New Virtual World of Education
Some say virtual worlds are good education resources.

At Issue
Do video games significantly enhance literacy?

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For More Information
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Citing CQ Researcher
Sample bibliography formats.

Cover photograph: Blizzard Entertainment/World of Warcraft
THE ISSUES

On a hot summer afternoon, eight teenagers gathered in the darkened basement of the Bronx Central Library to play the top-selling football video game “Madden NFL.” The Madden tournament in the Bronx, complete with prizes, is part of a growing effort at libraries across the country to lure a client who rarely darkens the door of a public library — the adolescent boy.

“If it wasn’t for the gaming stuff dragging me in that first time, I would have gone maybe once in the past two years,” says Ian Melcher, 17, a gamer in Ann Arbor, Mich., who had just checked out two calculus books. “I realized the library was pretty cool and had other things I was interested in.”

To persuade skeptical libraries to put video games on the shelf next to books, young librarians who grew up on games are drawing support from a surprising source — academic researchers. They claim that playing video games is practically a requirement of literacy in our digital age.

To many parents and baby boomers, playing video games looks like mindless activity. Yet the knowledge built into “Madden,” for example, employs a playbook the size of an encyclopedia. To win, players must have a sophisticated understanding of strategy and make split-second decisions about which play to choose.

“Games stress taking your knowledge and applying it. That’s pretty crucial in the modern world,” says University of Wisconsin Professor of Reading James Gee, author of the 2003 book What Video Games Have to Teach Us about Learning and Literacy.

Indeed, the argument that video and computer games are superior to school in helping children learn is gaining currency in academic circles. Claimed benefits include improved problem-solving, mastery of scientific investigation and the ability to apply information learned to real-life situations. Some of the more complex games, especially multiplayer games like “World of Warcraft” — played online simultaneously with thousands of players — lead some teens to engage in esoteric, online conversations about strategy and to create their own literary spin-offs or so-called fanfiction.

“Many video games require players to master skills in demand by today’s employers,” concluded a report released in October by the Federation of American Scientists, citing complex decision-making and team building. The organization urged the federal government to invest in research and development of educational games for K-12 students and for adult workforce training. 1

Science writer Steven Johnson, who popularized the pro-game argument in his 2005 book Everything Bad is Good for You, argues that when a child enters the world of a computer game, he is “learning the scientific method” as he tries out multiple hypotheses. 2 For instance, today’s youngsters don’t first sit down and read a rule book, the way baby boomers did. They start pushing buttons to see what happens.

That willingness to learn from failure uniquely prepared members of the dot-com generation, giving them an advantage as entrepreneurs and creative thinkers in the new economy, argue business experts John C. Beck and Mitchell Wade in their 2004 book Got Game. “A kid in the classroom has to worry about looking like an idiot. In a game, they’re raising their hand all the time, and true learning comes from failing,” concurs Dmitri Williams, assistant professor of speech communication at the University of Illinois at Urbana-Champaign. “When you strip away all the explosions, blood, magic coins, princesses and castles, video games are problem-solving tasks —
There’s some irony in the fact that kids are bored at school but rush home to solve these games where they learn math and history.”

As evidence that kids are willing to master language and concepts usually considered over their head, Johnson describes an hour spent teaching his nephew to play the urban planning-style game “SimCity.” While Johnson was trying to figure out how to save a dying industrial neighborhood, the 7-year-old piped up, “I think we need to lower industrial tax rates.”

“SimCity” creator Will Wright says the youngster probably didn’t understand tax rates any more than baby boomers understood mortgages when they played “Monopoly” as kids. But he thinks games teach something else. “The ability to reverse-engineer in your head a model of some arbitrarily complex thing is an incredibly valuable skill that you can apply to almost anything in this world,” he says, whether that’s doing your taxes, programming a new cell phone or predicting the effect of global warming.

Despite the worries of baby-boomer parents, there’s no evidence that video gaming is replacing reading among teens. According to a Kaiser Family Foundation survey, reading for pleasure has remained steady in the past five years even as video-gaming time has risen.

But what about teens who seem to spend most of their leisure time on games? Heavy gamers — more than an hour a day — actually spend more time reading for pleasure (55 minutes daily) than teens who play no video games at all (41 minutes), according to the Kaiser survey. And Kaiser found only 13 percent of adolescents were heavy gamers.

Nevertheless, the persistent anecdotes about teens and adults who skip meals, classes and even work to indulge in hours of video-gaming has led some to worry the games are addictive. Clinics have even sprung up claiming to treat “Internet addiction disorder.”

But many psychologists remain skeptical. “There’s hardly anyone I would class as a genuine video-game addict,” says Professor of Gambling Studies Mark Griffiths of Nottingham Trent University in Nottingham, England. Few players, he says, meet a strict definition of addiction, which includes withdrawal symptoms and a preoccupation so single-minded that every other aspect of life is neglected.

Experts are also divided over whether graphic violence in games like “Grand Theft Auto” has any lasting negative effects on players’ behavior, de-
spite a few cases in which a teen’s murderous frenzy has been blamed on games by the victim’s parents. Recent studies indicate that the younger a player is, the more likely he is to be negatively affected by video violence and the longer lasting the effect. (See sidebar, p. 948.)

Concerns about both addiction and violence have led to efforts to curb online role-playing games like “World of Warcraft” and “Lineage II.” Last year, the Chinese government imposed penalties on gamers who spend more than three hours playing a game by reducing the abilities of their characters. All the biggest online game operators said they would adopt the new system. The measures were designed to combat addiction in a country where more than 20 million Chinese play games regularly, mainly in net cafes. In one case, a player killed a fellow player who had stolen his virtual sword. (The penalties were later rescinded after widespread protests.)

Aside from worries about addiction and violence, not all scholars are equally enthusiastic about the learning value of video games on the market. In most games, the content is “garbage,” according to Harvard Graduate School of Education Professor Christopher Dede, “in the sense that it deals with imaginary situations that are not close to the knowledge and skills people need for the 21st century. To claim that learning magic spells is good preparation for the knowledge-based workplace is just plain silly.”

Dede is among those interested in adapting one of the most popular offshoots of gaming — virtual worlds — to educational aims. Player create characters (or avatars) who enter a virtual world. Hundreds of thousands of teenagers now participate in virtual worlds like There.com and Second Life, where they can create a character, buy clothes and real estate and meet other players’ avatars. (See sidebar, p. 952.)

In “River City,” created by Dede’s team at Harvard, players try to figure out the cause of a mysterious epidemic in a 19th-century town. Researchers found that middle-schoolers using “River City” improved their biological knowledge and science skills more than peers taught more traditionally. 5

Another sign of university interest: Colleges now offer courses in “Second Life.” Starting this fall, teens entering There.com will be able to take classes in areas like copyright law taught by university professors. But some advocates worry that all this high-level learning will be limited to middle-class kids, who have access to fancier, faster hardware and to educated parents who can guide their choice of games — creating a new equity gap on top of the existing reading gap between income groups.

While 83 percent of young people ages 8-18 have a video console at home, they may not be using them the same way. 6 A recent study of Philadelphia libraries with computers found that middle-class 12-13-year-olds typically used computers to increase their knowledge, by looking up — for example — Christopher Columbus on the encyclopedia site Encarta. But those from low-income neighborhoods were more likely to play “Magic School Bus,” a game for 9-year-olds. 7

The difference can be traced to the lack of guidance from a parent or other adult, which is as crucial for good games as for good books, says the University of Wisconsin’s Gee. “Giving a kid a book [or game] is okay, but with no adult to

<table>
<thead>
<tr>
<th>Age of Players</th>
<th>Gender of Players</th>
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<tr>
<td>Under 18</td>
<td>Male 62%</td>
</tr>
<tr>
<td>18-49</td>
<td>25%</td>
</tr>
<tr>
<td>50+</td>
<td>31%</td>
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Gamers at a Glance
- The average gamer is 33 years old.
- Women over 17 represent a larger portion of the game-playing population (30 percent) than boys under 18 (23 percent).
- 69 percent of U.S. heads of households play computer/video games.
- The average age of the most frequent game purchaser is 40.
- Adult gamers have been playing for an average of 12 years.
- Among the most frequent gamers, adult males average 10 years of playing, females, eight years.

Source: Entertainment Software Association
mentor the child and talk about the material it isn’t very helpful,” he says.

As video games increasingly become a fact of life in the lives of children and adults, here are some of the questions being debated by parents, academics, the gaming industry and players themselves:

**Does playing video games improve literacy?**

For the past year, nearly two-dozen 8-to-13-year-olds from low-income neighborhoods in Madison, Wis., have gathered after school to play the best-selling game “Civilization,” under the watchful eyes of University of Wisconsin researchers. Players rule a society from 4,000 B.C. to the present, building cities, trading, gathering natural resources and waging war. A single game requires about 20 hours to play; achieving high-level mastery requires 100 hours or more.

The children encounter words like “monarchy” and “monotheism” for the first time — but more important, they have to figure out how those and other factors, like natural resources, help a civilization survive or fail, says Kurt Squire, an assistant professor of educational communications and technology, who is directing the study.

“We found when they’re expert gamers, they can tell you the differences between civilizations, what technologies they would need, what resources they’d need,” he says. To Squire, the game’s lifelike simulation is a powerful twist on the progressive-education adage, learning by doing.

Students remember only 10 percent of what they read and 20 percent of what they hear but almost 90 percent if they do the job themselves, even if only as a simulation, according to research cited by the Federation of American Scientists. The University of Wisconsin’s Gee even claims that the mind works like a video game in that “effective thinking is more like running a simulation” than forming abstract generalizations.

An academic camp led by Gee argues video games foster a more sophisticated kind of literacy than the simple decoding of words. Video games foster creative thinking — producing “gaming literacies” in the words of Katie Salen, a designer at Parsons The New School for Design in New York City. Gamers not only follow the rules “but push against them, testing the limits of the system in often unique and powerful ways,” she says.

Digital literacy also means learning to take information from multiple sources, including Web sites and other players, rather than from one authoritative source like a teacher or textbook.

But Harvard’s Dede says that while games may be powerful learning tools, their content leaves much to be desired, and so far no research backs up the claim that games teach kids to think like scientists. To produce those results, he argues the engaging qualities of games must be married to scientific content.

Dede developed “River City” to teach basic science skills, such as forming a hypothesis. After 7,000 middle-school students tested the game-like simulation, they improved their scientific-inquiry skills and increased their knowledge of biology at twice the rate of peers using traditional hands-on labs.

But hard data like Dede’s is scant, and most studies have been done with only small numbers of children. The Federation of American Scientists, while enthusiastic about games’ learning potential, noted that while kids “seem to do better,” the research suffers from a lack of concrete measures of learning.

“We don’t have anywhere near sufficient evidence about whether playing computer games helps literacy,” says Justine Cassell, professor of communication studies and computer science at Northwestern University. On the other
hand, she adds, “There’s no evidence that computers hurt literacy.”

A computer game Cassell has developed for toddlers with a clown-like character can — much like an imaginary friend — help them develop sophisticated language earlier because they must explain what’s happening to an absent person. (For example, toddlers get more precise on the phone, saying, “John went to the store” instead of “He went there.”) Teens, she says, have a similar experience when blogging because they learn to write like journalists for an unseen audience.

The more than 4 million players of “Lineage” compete against one another for castles in a virtual kingdom of wizards, elves and knights. These “castle sieges” engage players in complex arguments online about strategy, according to University of Wisconsin researcher Constance Steinkuehler. 13

Steinkuehler found players’ online posts typically written at a 12th-grade reading level or above and often involve scientific reasoning. “I’ve watched kids who, in an effort to ‘cheat’ the game, gather data, build simple mathematical models and argue about those models,” which, she adds, educators say “is extremely difficult to get high-schoolers to do.”

Parents often despair because their teen is “not sitting on a couch reading a storybook, which is what we think literacy is,” says Gee. But “the kids’ version of literacy is better for a modern-world understanding of technical language,” Gee maintains.

In the best games, players must master a specialized game vocabulary, consulting Web pages for hints on winning that probably use syntax far more complex than their reading in school, Gee argues. “I believe firmly the key to school success is handling technical language,” he says.

To see how complex the language can get, Gee suggests looking at a Web site offering hints on playing “Yu-Gi-Oh” (both a video and card game). A typically impenetrable sentence reads, “The effect of 8-Claws Scorpion is a Trigger Effect that is applied if the condition is correct on activation.” Seven-year-olds are reading sentences like this, even though its complexity won’t be matched in the classroom until middle or high school, Gee says.

But can games produce the kind of literacy we most value? The technical material highlighted by enthusiasts is closer to technical manuals than novels and “more likely to appeal to techies than to dreamers, humanists and conversationalists” and to boys rather than girls, worries Harvard Professor of Cognition and Learning Howard Gardner. Immersing oneself in long novels like Madame Bovary, in poetry or in a philosophical text involves a skill many game enthusiasts disparage — linear thinking over many pages. That’s “an entirely different mental faculty than is exploited when one surfs the Web from one link to another,” Gardner argues.

Moreover, even a good video game can’t compete with a great teacher, asserts former teacher Joan Almon, coordinator of the Alliance for Childhood in College Park, Md. “It bothers me that computers hurt literacy.” In its recent report, however, the Federation of American Scientists urges teachers to change from their “tell and test” method — which encourages passive learning — to incorporating the highly interactive, challenge-reward environment of video games. Game developers have incorporated the best learning features recognized by cognitive science, the report says, including:

• tons of practice;
• continual monitoring and feedback on the player’s progress;
• encouragement to seek out information on the game strategy from other gamers, friends and Web sites; and,
• bridging the gap from what’s learned to real situations. 14

Some enthusiasts point out that the Internet is already allowing teenagers to become online creators on a huge scale via blogs, music and mini-films known as machinima — often inspired by games. Players have posted several-hundred-thousand stories ranging from 10-page plots to small novels as part of the best-selling computer game of all time, “The Sims,” where players create their own family and play virtual house.

Some of that interaction could even raise the level of public discourse. In

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Gamers Are Not Isolated, Obsessed

Contrary to the stereotype, gamers are not socially isolated people glued to their PlayStations, Xboxes or computers. Players say they spend more than three times as much time each week (23.4 hours) exercising, playing sports, volunteering, attending cultural activities or reading than they spend playing games (6.8 hours).

Percent of gamers who say they:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
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<tr>
<td>Exercise or play sports at least 20 hours a month</td>
<td>79%</td>
</tr>
<tr>
<td>Volunteer at least 5.4 hours per month</td>
<td>45%</td>
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<tr>
<td>Regularly read books or daily newspapers</td>
<td>93%</td>
</tr>
<tr>
<td>Attend concerts, museums, theater</td>
<td>62%</td>
</tr>
<tr>
<td>Play games with others in person at least 1 hr/wk</td>
<td>51%</td>
</tr>
<tr>
<td>Play games with others online at least 1 hr/wk</td>
<td>25%</td>
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Source: Peter D. Hart Research Associates, 2004

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Available online: www.cqresearcher.com
Are video games addictive?

Jeffrey Stark, a high-school student from Ontario, Canada, claimed his compulsive playing of the sword-and-sorcery game “EverQuest” ruined his life. He went for a week without bathing or eating a proper meal and stopped going to school for a semester.  

Similarly, a 30-year-old registered nurse who plays “EverQuest” with her husband said, “We spend hours — hours! — every single day playing this damn game. My fingers wake me, aching, in the middle of the night. I have headaches from the countless hours I spend staring at the screen. I hate this game, but I can’t stop playing. Quitting smoking was never this hard.”  

About 40 percent of players of multiplayer online games like “EverQuest” say they consider themselves “addicted.”  

In South Korea, the epicenter of online gaming, game addiction reportedly claimed 10 lives in 2005, mainly by cutting off circulation when sitting for hours at the screen. In April, the South Korean government launched a game-addiction hotline, and hundreds of hospitals and private clinics treat the addiction, said to afflict an estimated 2.4 percent of Koreans ages 9-39.  

Europe’s first clinic for video-game addicts opened in the Netherlands in 2005, and several psychologists treat Internet addicts in the United States. Since starting the Computer Addiction Services program at McLean Hospital — a noted psychiatric facility in Belmont, Mass. — in 1995, Harvard psychologist Maressa Hecht Orzack has treated many gamers who she said were neglecting their jobs, schoolwork and families. “They have withdrawal symptoms. They can’t wait to get back on [the

spair of gaming spouses and significant others.”  

The creator of the most popular PC game of all time is lanky, bespectacled and surprisingly bookish. Will Wright is already famous for creating “The Sims,” akin to playing house, which has sold close to 60 million copies. He’s also famous for designing one of the most creative games, “SimCity,” an urban-planning game so sophisticated it was later used to train city planners.  

But the game world is most excited about the new game — “Spore” — that Wright is developing to be released next year by Entertainment Arts. It started out as a game about extraterrestrial life. But in preparation, Wright says, he read 100 books, including many about biology, which led him to a fascination with evolution, the current game’s theme.

In “Spore,” players create characters who progress from a one-celled organism to an entire race of creatures using principles of evolution. Will your creature be an herbivore or a carnivore? Will you give it two limbs or 5? And will it survive with the claws you’ve picked out? (If not, go back and pick something different.) Once you’ve created a creature, you’ll move on to creating tribes, communities and planets. Wright estimates it would take 70 years to visit every planet in “Spore.”  

But the most revolutionary part of “Spore,” may be players’ ability to access other gamers’ creations for their own play.

Once players’ creations are uploaded onto Spore’s server, they can even request their friends’ creations.

As a child, Wright was drawn to taking things apart, which got him interested in robots and ultimately computers, he said in an interview at his studio in Emeryville, Calif. Yet Wright, 46, considers himself part of the generation that grew up reading manuals. By contrast, today’s kids press buttons in a game to see what happens — a practice he says leads to more creativity. It also gives kids an early experience with testing models in a simulated environment, an important skill as science and other fields increasingly revolve around simulation, he believes.

Wright challenges the basic notion that it’s more educational to read a book than to play a game. “You can step back and see that our natural mode of interacting with the world is not to sit back passively, observe it as a movie or book would present it, but to interact with it and actually have effects on the system and study the effects,” he says. Play was probably the first educational activity, he suggests, which permitted us to parse out patterns in the world around us.

“I think you can do that to a limited degree with storytelling but not nearly as deeply as with an interactive experience,” Wright says. “Yeah, Harry Potter is a great universe and all that, but you can’t take the stuff you know about Harry Potter’s universe and apply it anywhere else.”
Players are starting to use his games increasingly for self-expression, not just entertainment, Wright observes, which could help explain their enduring popularity. A feature added to “The Sims” that allows players to write stories in the game and save them on a Web page resulted in several-hundred-thousand short stories, novels and biographical accounts that players “were pouring their heart and soul into,” says Wright. Fans “form a very tight community around these games,” he observes, as they browse one another’s stories, download content and create new elements. A moviemaking feature in “Sims2” led to tens of thousands of movies being created by players.

“Spore” will give players unprecedented room for creation. In “The Sims,” players can manipulate the face, but it’s still a two-legged creature, Wright points out. “This is designing content in a different way that allows the player to have all the freedom,” he says. But when this visitor played a preview of the game, it was apparent even the most imaginative designers set limits, suggesting that creativity inside a game isn’t the same as creativity outside — a major concern of some educators.

First there’s the aesthetic style — cute creatures familiar to young watchers of Pixar movies and reminiscent to older viewers of Flintstone dinosaurs. What if one wanted to create something more frightening?

“Within ‘Spore’ we offer a series of editors that serve as creative toolkits for making everything from creatures and vehicles to plants and buildings,” says Executive Producer Lucy Bradshaw. “What these look like is up to the player. So, I might do something cute and cuddly and sort of Teddy Bear-ish, or I might make a really frightening creature with spindly spider legs and an angry-looking beak that looks like it came out of a horror film. It’s all about my personal aesthetic. We want Moms to enjoy this just as much as their 15-year-old sons!”

But some prominent addiction experts say even those who play games excessively rarely meet all the characteristics of addiction — such as developing physical withdrawal symptoms like sweating (true for gambling), needing to play more and more to get the same kick and being preoccupied to the point it is destructive to one’s livelihood and family. Even though some psychologists talk about “Internet addiction disorder,” the American Psychiatric Association has not recognized it in its official handbook, the Diagnostic and Statistical Manual of Mental Disorders.

Psychologist and gambling studies professor Griffiths, at Nottingham Trent University, found in a study that one-in-20 British children reported playing more than 30 hours a week. But Griffiths says very few of those children — or the population generally — meet all of the criteria for addiction. “It’s quite clear when a parent rings me and says, ‘My little Johnny is addicted,’ it’s hard to fulfill more than one or two of the criteria,” he says. “Their real concern is the vast amount of time they’re playing. The real question is: To what extent is it having a negative effect on their life?”

For a 38-year-old man with three children and a good job, playing 14 hours daily will negatively affect his livelihood and family. But for an unemployed 23-year-old with no partner or children, the same amount of time “has nothing but positive effects” if it brings him into a social network and raises self esteem, says Griffiths.

Even if they’re not technically addicted, users of multiplayer online role-playing games who play on average 20 hours a week tend to describe their game play as “obligation, tedium and more like a second job than entertainment,” according to Stanford University researcher Nick Yee. 21

For example, if a player wants to engage in pharmaceutical manufacturing, one of many possible career choices in “Star War Galaxies,” it takes about three to six weeks of normal game play to acquire the abilities to be competitive. Most such games — which get harder as the player becomes more skilled — use designs based on behavioral conditioning, according to Yee, which conditions players to work harder and faster as they improve, creating a kind of digital treadmill of which players are often unaware. 22

The work required to advance a character’s abilities is so time-consuming that companies like TopGameSeller, based in Shanghai, China, offer services to bring one’s character up to a more advanced level. Bringing a character in “World of Warcraft” to a higher level. can cost up to $1,488. “We assign two or three expert players to your character to do the leveling,” the company promises on its Web site (www.topseller.com), which...
largely involves “simply killing monsters over and over.”

Even Griffiths notes that magazines often rate games on their “addictiveness” as a positive attribute. “It’s quite clear that the reward systems in video gaming are similar to gambling,” he says. “I don’t pick up a video game unless I know I have six hours to burn. If I start now, I’ll still be playing at 10 p.m. As soon as you’ve beaten the high score, you want to beat it again.”

Many parents worry that video games are displacing other activities like socializing, creative play and reading. But recent surveys show that teen reading has not declined, even as videogaming hours have risen. And researchers like Yee find that online gaming takes on a social cast, as players communicate over typed chat.

In any case, game enthusiasts and critics alike say parents must set limits, as with any activity.

**Do video games prepare young people for the future job market?**

“You play ‘World of Warcraft? You’re hired!” Someday those words may be spoken by employers — if they’re not already — two technology experts wrote in Wired, praising multiplayer games for teaching important workplace skills. 23

In “Warcraft,” players band together in guilds to share knowledge and manpower in a “quest,” such as slaying monsters. To run a large guild, a master must be able to recruit new members, create apprenticeship programs, orchestrate group strategy and settle disputes. One young engineer at Yahoo used to worry about whether he could do his job. “Now I think of it like a quest,” he said. “By being willing to improvise, I can usually find the people and resources I need to accomplish the task.” 24

Indeed, becoming a guild master “amounts to a total-immersion course in leadership,” argue John Seely Brown, former director of Xerox’s Palo Alto Research Center, and Douglas Thomas, an associate professor of communication at the University of Southern California’s Annenberg School for Communications. 25

Business experts Beck and Wade came to similar conclusions after surveying 2,100 young professionals, mainly in business. In their book Got Game, they claim those with extensive gaming experience were better team members, put a high value on competence and had more potential to be superior executives. Perhaps most important, they argue, gamers understand that repeated failure is the road to success. They found that 81 percent of those under age 34 had been frequent or moderate gamers. 26

In their most provocative assertion, Beck and Wade claim the dot-com phenomenon was “structured exactly like a video game” in that it called for entrepreneurial skills and a fearlessness toward failure in a generation that grew up gaming. Among the rules learned from gaming were:

- If you get there first, you win;
- Trial and error is the best and fastest way to learn;
- After failure, hit the reset button; don’t shrink away. 27

As Stanford researcher Yee has discovered, many players view playing multiplayer online games as work. Players in “Star War Galaxies” who pick pharmaceutical manufacturing as a career must decide how to price and brand their products, how much to spend on advertising and whether to start a price war with competitors or form a cartel with them. Once players acquire the skills to be competitive in the market, their business operations require a daily time commitment. 28

Yet today’s schools, obsessed with reading and writing, are preparing children for jobs that soon will be outsourced overseas, claims David Williamson Shaffer, associate professor of learning science at the University of Wisconsin-Madison. “The only good jobs left will be for people who can do innovative and creative work,” he writes, arguing that video games that teach professional-level language can accomplish that task better than traditional schooling. 29

A Federation of American Scientists report recently endorsed that view, urging government, industry and educators to take advantage of video-game features to “help students and workers attain globally competitive skills.” 30 It said video games could increase the speed at which expertise is acquired, improve players’ ability to apply learning and improve decision-making — all important for the coming “conceptual economy.”

Already gamers are running political campaigns, negotiating treaties and building environmentally sensitive communities, the report notes. 31 Ashley Richardson was a middle-schooler when she ran for president of Alphaville, the largest city in the popular multiplayer game, “The Sims Online.” She debated her opponent on National Public Radio in her campaign to control a government with more than 100 volunteer workers, which made policies affecting thousands of people. 32

By contrast, students who pass typical school tests often can’t apply their knowledge to real-life problems, according to research cited by Shaffer. Students who can write Newton’s laws of motion down on a piece of paper still can’t use them to answer a simple problem like, “If you flip a coin into the air, how many forces are acting on it at the top of its trajectory?” 33

Shaffer has designed games that teach middle- and high-school students to think like professionals in solving real-life problems. Students who play urban-planning or science games developed by Shaffer soon develop more sophisticated, professional-level language in those areas, he reports. For example in one game, students help the Chicago Transportation Authority choose what type of seats to put on new buses. “Before playing the game, a player was likely to say, ‘I’d choose this seat because it looks comfortable;’” says Shaffer. “Afterwards, the same player says, ‘I’d

Continued on p. 948
Chronology

1950s-1960s
Pinball becomes popular among young adults. Early video games are included on computers used by computer students.

1958
Government physicist William A. Higinbotham invents first computer game — electronic Ping Pong.

1961
MIT student Steve Russell creates the rocket-ship game “Spacewar!” Loaded into computers used in tech courses, it exposes computer-science students to the first video game.

1970s
First commercial video games are marketed to families and young singles in arcades.

1972
Magnavox introduces Odyssey, first home video-game console.

1976
Computer game “Adventure” first allows players to control characters’ behavior.

1977
Atari introduces first video home console with plug-in cartridges.

1980s
Video-game popularity spikes with Atari in early 1980s; Atari goes bust and industry collapses; Nintendo revives industry at end of decade.

1980
“Pac-Man” is introduced.

1982
Atari sells almost 8 million units. Surgeon general says games create taste for violence.

1984
Warner sells Atari as sales wane.

1985
Popular games “Tetris,” “Where in the World is Carmen Sandiego?” and “Super Mario Bros” are introduced.

1989
Nintendo introduces Game Boy; “SimCity,” popular urban-planning computer game, is released.

1990s
“First-person shooter” games introduce realistic violence; as sales spike, juvenile violence declines. Multiplayer online games, complex PC games are introduced.

1991
“Civilization,” a history game that takes hours to play, is introduced.

1992
“Wolfenstein 3D” is introduced — the first first-person shooter game.

1993
Introduction of “Doom,” with more blood and gore.

1994
Sony PlayStation is introduced.

1997
“Grand Theft Auto,” a gang-member survival game, is introduced.

1999
“EverQuest,” early online multiplayer game, is introduced.

2000s
Concern about excessive game violence and potential for game addiction leads to calls for curbs; number of female gamers rises.

2000
“The Sims,” a game about relationships popular with girls, is introduced; becomes best-selling computer game of all time.

2002
Microsoft launches Xbox Live, the first online multiplayer console network. U.S. Army launches “America’s Army” to recruit and train soldiers.

Nov. 9, 2004
“Atari” sci-fi game, creates biggest-grossing media day in history.

2004
The parents of British teenager Steven Pakeerah, murdered by a friend in England, blame his killer’s obsession with violent games.

2005
Chinese government penalizes gamers who play for more than three hours. American Psychological Association calls on companies to reduce violence in video games for children and teens. Sen. Hillary Rodham Clinton, D-N.Y., introduces bill to ban rentals, sales of Mature or Adult Only games to minors.

October, 2006
MacArthur Foundation announces grant of $50 million over five years to research how people learn from video games, other digital media. Federation of American Scientists recommends federal research on educational potential of video games.
Do Video Games Make Kids More Violent?

After 14-year-old Stefan Pakeerah was savagely murdered in England by a friend, his parents claimed the murderer had been obsessed by the violent computer game “Manhunt,” which awards points for savage killings. Warren LeBlanc, 17, who pleaded guilty in 2005 to the murder, had beaten Stefan with a hammer and stabbed him repeatedly after luring him to a local park, the press reported.

Stefan’s parents blamed the game and asked retailers to stop selling it. “It’s a video instruction on how to murder somebody; it just shows how you kill people and what weapons you use,” Patrick Pakeerah said last year, after several major British retailers agreed to stop selling the game. 3

There is substantial debate among psychologists over whether violent behavior can be blamed on video games, since game players are often exposed to violence from other sources, such as TV or their own lives. Although few long-term studies have been done to see if the effects are long-lasting, many U.S. psychologists are alarmed. Last year, the American Psychological Association adopted a resolution recommending that all violence be reduced in video games marketed to children and youth. The policy decision came after an expert committee reviewed research indicating that exposure to video-game violence increases youths’ aggressive thoughts and behavior and angry feelings. 2

In violent scenes, the committee noted, perpetrators go unpunished 73 percent of the time — teaching children that violence is an effective way to resolve conflict. Some studies also suggest that the active participation peculiar to video games may influence learning more than the kind of passive observation involved in watching TV, the panel pointed out.

“Playing video games involves practice, repetition and being rewarded for numerous acts of violence, which may intensify the learning,” said Elizabeth Carll, a New York psychologist who chaired the committee. “This may also result in more realistic experiences, which may potentially increase aggressive behavior.” 3

Mark Griffiths, a psychologist at Nottingham Trent University in Nottingham, England, agrees. “I’ve concluded the younger the person, the more likely there is to be an effect,” he says. “If children watch or play video games, right afterwards they will mimic what they see on the screen.”

But Griffiths is more skeptical about the lasting effects of video-game violence, especially in older teens and adults. “Video games may have a contributory effect, but overall the evidence is quite slim,” he says. “I think there’s a predisposition of people who play violent video games to violence anyway. Youthful offenders play more violent video games than average. My guess is these people already have problems to start with and seek out that kind of game — not that they become more violent as a result of playing those games.”

Another leading researcher at the other end of the spectrum, Iowa State University psychologist Craig Anderson, finds some effects persist in young children. In a recent study of third-, fourth- and fifth-graders, he found that those who played more video games than their peers early in the school year became more verbally and physically aggressive over the course of the year. He describes exposure to violent video games as a “risk factor” — one of many that could contribute to this behavior. 4

Seven states limit or ban the sale of violent video games to minors. But most such laws have been overturned after legal challenges by the game industry, usually as unconstitutional in-

Continued from p. 946

choose this one because you get more seats on the bus, it’s less expensive and has a higher safety rating. These were exactly the criteria the bus company was looking at.”

Indeed, simulation games have long proven to be effective in training people for a variety of skills, including performing surgery. More than 6 million people have registered to play “America’s Army,” a game released by the military in 2002 to teach military skills; 3 million completed the basic combat-training course and 3 million completed the three-lecture medic course. 54 And some soldiers in Iraq say playing video games gave them the skills they needed for real battles. 35

Simulations might be a powerful technique, but they are not the same as real life, observes Harvard’s Gardner. “I am happy to have medical students or airplane pilots in training learn as much as they can from simulations — but I also want them to have some real, high-stakes experience,” he says. And these are two areas where simulation makes sense, he notes. “I don’t think it makes sense for many professions, ranging from poet to priest.”

The biggest success stories involve skills associated with science, technology or engineering. “I want my children — indeed all young people — to learn how to think like a historian, a philosopher, an economist, a literary critic,” says Gardner. “I want to stimulate their imaginations to create their own worlds, not just that conjured up by the makers of ‘World of Warcraft.’ ”

Some critics worry that the game-playing 20-something generation never gained some of the socialization skills and creativity needed in the workplace. The Alliance for Childhood’s Almon doubts that chatting online in a multi-player game can substitute for face-to-face interaction.

“We’ve been told by one software company that they have to spend so much time teaching the young 20s how to work with others because they’ve grown up in isolation,” she says. The way children traditionally developed those problem-solving skills was by creating their own play situa-
fringements on free speech. None of the laws is currently being implemented, according to the Child-Responsible Media Campaign, which advocates restrictions. 7

Sen. Hillary Rodham Clinton, D-N.Y., introduced a bill in Congress last year that would make it illegal to rent or sell a video game with Mature or Adult Only ratings to minors. Clinton, who said she was disturbed by the sexually explicit content of “Grand Theft Auto,” as well as the violence, cited findings that boys as young as 9 often could buy Mature-rated games. 5 But Clinton’s bill also could run into constitutional problems, say even those who advocate restrictions. 7

“Grand Theft Auto: Vice City,” which debuted in 2002, drew criticism for its violence. Players can steal vehicles, engage in drive-by shootings and robberies and buy weapons ranging from submachine guns to hand grenades. Members of gangs also engage in shoot-outs.

Courts have been skeptical of a link between video games and violence. For example, a district court in Michigan blocked implementation of a state ban on sales of violent video games to minors. The decision reflected concern that Anderson’s studies had “not provided any evidence that the relationship between violent games and aggressive behavior exists. It could just as easily be said that the interactive element in video games acts as an outlet for minors to vent their violent or aggressive behavior, thereby dimming the chance they would actually perform such acts in reality,” the court declared. 8

Yet game-industry spokesmen also point out that juvenile-crime statistics dropped sharply as the violence in video games crested and have not spiked since. (The breakthrough in realistic video-game violence can be traced to the 1992 release of “Wolfenstein 3 D,” the first major “first-person shooter” game, where the player saw the game world through the eyes of the character and enemies fell and bled on the floor.) “Just as violent video games were pouring into American homes on the crest of the personal-computer wave, juvenile violence began to plummet,” according to University of Pennsylvania criminologist Lawrence Sherman. “Juvenile murder charges dropped by about two-thirds from 1993 to the end of the decade and show no signs of going back up. If video games are so deadly, why has their widespread use been followed by reductions in murder?” 9

Yet, historians, rousing many of the same fears that video games do today. In the 1930s, New York Mayor Fiorello La Guardia smashed pinball machines with a sledgehammer and banned them — a ban that was only lifted in the 1970s. 57

In 1958, William A. Higinbotham, a physicist at Brookhaven National Laboratory on Long Island, invented a game of electronic Ping-Pong. Although the game was dismantled the next year — its components were needed for other projects — it was remembered by a future editor of Creative Computing magazine, David Ahl, who had seen the game during a high school visit. He dubbed Higinbotham the grandfather of video games. 38

BACKGROUND

Pinball Precursor

Pinball was the mechanical precursor of video games, say some historians, rousing many of the same fears that video games do today. In the 1930s, New York Mayor Fiorello La Guardia smashed pinball machines with a sledgehammer and banned them — a ban that was only lifted in the 1970s. 57

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However, Massachusetts Institute of Technology (MIT) student Steve Russell is generally considered the inventor of video games. In 1961, he created a rocket-ship game called “Spacewar!,” which could be played on one of MIT’s computers. The manufacturer of the computer, Digital Equipment Corp., began shipping its computers pre-loaded with the game, exposing computer-science students across the country to “Spacewar.”

In 1972, Magnavox introduced “Odyssey,” the first home video-game console, which Magnavox marketed as a family game. Until the early 1980s manufacturers also marketed arcade games to single adults as having sex appeal. Slow adoption of video games through the 1970s culminated in the 1977 introduction of Atari — the first video-game console to use plug-in cartridges rather than built-in games. Atari became one of the most successful introductions in history, selling about 3 million consoles a year. Atari was considered wildly popular in the early 1980s until its manufacturer collapsed.

Nintendo revived the industry in the late 1980s, and since then a wide variety of consoles and games have been introduced, including Sony’s PlayStation and Microsoft’s Xbox. A variety of other games have been designed for personal computers. As computer animation permitted film-like dramas with original scripts and music, computer games became increasingly sophisticated, bearing little resemblance to the black and white blips of Higinbotham’s original game.

The late 1980s were a crucial turning point in the social history of video games, according to Williams, at the University of Illinois. Games began moving from bars, nightclubs and arcades to homes as prices dropped, houses expanded and Americans had more disposable income. Driven by Nintendo’s marketing, games became the province of children for the next 10 years.

Video games also ushered in a new generation of young people “comfortable and techno-literate enough to accept personal computers, electronic bulletin boards, desktop publishing, compact disks and the Web,” he writes, and pushed the development of microprocessors, broadband networks and display technologies.

Today half of all Americans 8-18 have a video-game player in their bedrooms. But surveys suggest that low-income children aren’t getting the same access to technology as their middle-class peers — a video-gaming “equity gap” that resembles the so-called digital divide between those with and without Internet access. Although 87 percent of teens use the Internet, those who don’t are generally from lower-income households with limited access to high-tech hardware and are disproportionately African-American. That could mean they lack access to some of the more complex games played on computers and online. Con-
vinced of games’ educational potential, Global Kids, a nonprofit that provides education on international issues to urban youth, has obtained a Microsoft grant to teach disadvantaged New York City teens to design and play games.

“Some of these kids don’t know how to move a cursor into a Web browser,” says Global Kids’ Online Leadership Director Barry Joseph. Paradoxically, most attend schools with plenty of computer equipment — courtesy of Clinton-era funding. But many of the students are not connected to the Internet because teachers are often unfamiliar with the technology, Joseph says.

“Middle-class homes have multiple gaming consoles, broadband and adults familiar enough with systems to encourage young people” to play games with learning potential, Joseph says. By contrast, lower-income kids may only have access to a computer at the school library, where daily time is limited to 10 minutes, mandatory filters block the ability to blog and computers have no capacity to store kids’ creations, notes MIT’s Director of Comparative Media Studies Henry Jenkins.

However, surveys about access may not tell the real story about who’s benefiting from technology. “Some folks are using the technology in new ways; others are less digitally savvy and are just playing Gameboy. That may be the real divide in who has positive effects,” says Connie Yowell, director of educational grant-making at the MacArthur Foundation, which is helping Global Kids and other groups study how young people are using technology.

**Gender Gap Narrows**

Boys between 8 and 18 spend more than twice as much time playing video games as girls, according to a recent Kaiser Family Foundation survey. Some have blamed girls’ lower interest on the scarcity of sympathetic female characters and game designers.

“Games were built by boys for boys,” Northwestern’s Cassell found in 1997 when she co-edited From Barbie to Mortal Kombat, a book of scholarly essays on the gender slant of video games.

But Cassell and other experts say the gender gap has been narrowing. Today, women over 18 represent 30 percent of U.S. gamers — a greater proportion than do boys 17 and under (23 percent). “Boys may be playing more traditional video games,” Cassell says, “but girls are playing more ‘Sims,’ ” which is akin to playing house.

And virtual worlds are much more popular among females. Females make up the majority of the 400,000 subscribers to There.com, a virtual world where participants can create a character to interact with others, according to Michael K. Wilson, CEO of Makena Technologies, the company behind the site. Socializing and shopping seem to be two major draws for teenage girls, he says.

“It’s very clear to us that teens are very interested in shopping. There.com is the holy grail of shopping sites. You can try on a dress or your avatar can ask friends how you look in it,” says Wilson. There.com has also experimented with Nike and Levi Strauss & Co. to turn that click on a product into a real-world purchase.

In Second Life, another virtual world, companies like Reebok and Amazon have set up shops to sell real-world versions of their products as well as virtual ones. Another magnet drawing women has been the rise in so-called casual games — which may take as little as 10 minutes to play, such as Solitaire, mahjong and some short action games. In the past few years, thousands of such games have sprung up on the Internet and game consoles.

The typical casual game players are women in their 40s, one of the fastest-growing sectors of the industry, according to the International Game De-
Entering the New Virtual World of Education

Students enrolled in “Law in the Court of Public Opinion” at the Harvard Extension School in fall 2006 log onto their computers every Thursday evening and send animated versions of themselves into a virtual classroom. There, a so-called avatar — another animated persona — representing Law Professor Charlie Ness (looking about 20 years younger) teaches the course in real time, using Ness’ real voice. An avatar representing Ness’ daughter Rebecca, a computer expert, occasionally flies down from the ceiling to help teach the course.

Harvard is one of several universities that have begun entering game-like virtual worlds to reach a wider audience. The audience is large and growing at a rate of 10-20 percent a month by some estimates. 1

Ness teaches his course in the virtual world of Second Life, which boasts more than 1 million inhabitants. 2 Participants enter the Second Life fantasy world to meet people and buy and sell virtual real estate, clothes and other goods. (Linden Labs, the company behind Second Life, makes most of its money leasing virtual land to tenants.) In spring 2006, the 20 courses offered in Second Life included “Theatre and Culture,” from Case Western Reserve University, and Stanford University’s “Critical Studies in New Media.”

Second Life’s virtual library offers monthly book discussions, talks by authors (as avatars, of course) and a reference service. It was created because of college students’ tendency to use online resources instead of brick-and-mortar libraries, according to Lori Bell, director of innovation at the Alliance Library System in East Peoria, Ill., which helped create the virtual library. As for being in virtual worlds, she observes, “The library needs to be there or we’re going to start losing people.”

So far, 2,000-3,000 people a day visit the library, according to Bell. “We get a lot of people coming because it’s a safe place.” Elsewhere in Second Life, she notes, “There’s a lot of sex, gambling and adult places. The library is somewhere you don’t have to buy anything, you don’t have people hitting on you, and people are friendly.”

Much like the real world, people enter a virtual universe for a variety of reasons, and education is not necessarily at the top of the list. Lauren Gelman, associate director of the Stanford Law School’s Center for Internet and Society, says when she first entered the popular virtual world of There.com — with 400,000 subscribers between ages 13 and 26 — “the first thing that happened is I got propositioned.” With islands populated by avatars in bikinis, she says, “It’s a very Club Med kind of environment.”

This fall, Gelman became dean of a virtual university in There.com — the State of Play Academy — which will offer courses by experts in technology-related areas of law such as copyright, patents and trade secrets. 3 Eventually, the academy might even offer a degree-like certificate, Gelman says.

Students who come to these classes are expected to bring a better grasp of technology than the law professor, permitting a two-way transfer of information. “Sometimes I’ll be the teacher and sometimes the student,” says Gelman, who teaches a course on technology and law at Stanford.

The power of virtual worlds to project situations in 3-D means students can “experience” what they’re learning. To train health-care professionals in how to deal with bioterrorism and natural disasters, for example, Idaho State University provides simulations in Second Life of earthquakes and fires, injured victims and how to treat them. 4 Recently, the library invited residents to heckle Tudor King Henry VIII of England and ask his wife Ann Boleyn what it felt like to be beheaded. Two librarians acted out the roles as avatars in full 16th-century dress.

This summer, teens in Second Life participated in a virtual summer camp aimed at building awareness of global issues like sex trafficking, sponsored by Global Kids, a New York-based group that teaches urban youth about leadership and global citizenry. 5 “We take real-world issues and do something about it in a way you could never do in real life,” says Barry Joseph, online leadership director at Global Kids. “In Second Life, you can click on someone’s `Save Darfur’ green wrist band and get information about what’s going on right now in Darfur.”

The argument that kids learn better in the video universe has been a major influence on pioneers like Gelman. “If we know there’s educational value in that kids think differently when they navigate these worlds, could we put it to better use to teach them substantive stuff while they’re sitting in front of ‘World of Warcraft’ for 10 hours on a Saturday?” asks Gelman. “It could be at the cusp of something completely revolutionary in education — or it might not work.”

3 http://stateofplayacademy.com/
5 www.globalkids.org.

But “we’re finding girls are interested in open-ended exploration and engaging with teams, so they’re doing science differently,” she says. Similarly, multiplayer online games that are drawing female players are designed around open-ended exploration that allows team-like player networks to develop, she says.

“I ask girls whether they’re good at computers and they say ‘No’ even though they are,” says Northwestern’s Cassell, noting their growing presence in games and blogging. “The traditional definition of a game excludes the kinds of things girls like. It’s not true that girls don’t like games.”

Continued on p. 954
Do video games significantly enhance literacy?

Pop culture today often involves quite complex language, and that matters because the biggest predictor of children’s school success is the size of their early vocabularies and their abilities to deal with complex language.

Consider, for example, a typical description of a “Pokemon” (“pocket monsters” found in video games, cards, books, movies and television shows): “Bulbasaur are a combination of Grass-type and Poison-type Pokemon. Because they are Grass-type Pokemon, Bulbasaur have a combination of Grass-type and Poison-type characteristics.” Or consider this from a Web site for “Yu-Gi-Oh” (another card, game, book, movie phenomenon): “The effect of ‘8-Claws Scorpion’ is a Trigger Effect that is applied if the condition is correct on activation.” Lots of low-frequency words here, complex syntax, as well. Children as young as 6 and 7 play “Pokemon” and “Yu-Gi-Oh.” To play they have to read — and read complex language.

The biggest barrier to school success is the child’s ability to deal with complex “academic” language, the sort of language in textbooks. Such language starts to kick in about fourth grade and ever increases thereafter in school. Children who learn to decode, but can’t read to learn in the content areas later on, are victims of the well-known “fourth-grade slump.” Worse yet, research shows that even children who can pass tests in the content areas of today are impressive, but they still represent only a very partial sampling of the kinds of minds that young people can be cultivated in front of a screen. But too much time can be wasted on simulations — but they also require real, high-stake experience. Patients have feelings; simulacra and robots don’t. And note that these are two areas where simulation makes sense. In many other professions, from poets to priests, they don’t.

Which leads to the most important point. Literacy is far more than expertise in technical manuals or even in understanding science and technology, important as they are. It entails the capacity to immerse oneself and, ultimately, to experience. Patients have feelings; simulacra and robots don’t. And note that these are two areas where simulation makes sense. In many other professions, from poets to priests, they don’t.

In sum, the treasures and skills entailed in the video games of today are impressive, but they still represent only a very partial sampling of the kinds of minds that young people have and the kinds that can and should be cultivated. Some can be cultivated in front of a screen. But too much time there is not healthy on any criterion — and any slice of life — no matter how engrossing — is only partial at best. So two cheers for Jim Gee — but two cheers as well for Mark Hopkins.* on one end of a log, and an eager questioner and listener on the other.

* A 19th-century president of Williams College.
CHART OF VALUE

<table>
<thead>
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<th>Value</th>
<th>Percentage</th>
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<tr>
<td>Sales</td>
<td>$7 billion</td>
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<tr>
<td>Games</td>
<td>Nearly 230 million</td>
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<tr>
<td>Players</td>
<td>81 percent</td>
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**HUNDREDS OF MILLIONS OF PEOPLE AROUND THE WORLD USE COMPUTERS THAT RUN THE WINDOWS OPERATING SYSTEM, AND ABOUT HALF OF THEM PLAY GAMES, ACCORDING TO MICROSOFT SURVEYS.**

The driving force, most analysts say, are subscription-based online multiplayer games played on computers. Games like “World of Warcraft” are expected to take in more than $2 billion worldwide.

**TEENS HAVE BEEN A BIG CONTRIBUTOR TO THIS GROWTH, WITH 81 PERCENT OF TEENS — 17 MILLION PEOPLE — USING THE INTERNET TO PLAY GAMES ONLINE, ACCORDING TO THE PEW INTERNET & AMERICAN LIFE PROJECT. THAT’S A 52 PERCENT JUMP SINCE 2000.**

**SOCIAL NETWORKING**

With 81 percent of all teens playing online video games — up from 66 percent in 2000 — online games have become a widespread form of social networking, according to Amanda Lenhart, senior research specialist at the Pew Internet & American Life Project.

“AS WITH ALL THINGS ON THE INTERNET, IT’S POSSIBLE TO MEET ALL SORTS OF PEOPLE,” SAYS LENHART. “I’VE HEARD FROM A LAW-ENFORCEMENT OFFICER ABOUT A PERSON WHO WAS PREYED UPON BY SOMEBODY THEY MET IN A GAME. BUT THE VAST MAJORITY OF PEOPLE I’VE TALKED TO HAVE NOT MENTIONED ANY TROUBLE WITH THAT SORT OF THING.”

Virtual worlds help teens with two crucial developmental issues — developing an identity and interacting with peers, says Northwestern’s Cassell. “That’s why they’re so popular. They’re all about trying on different identities and manifestations,” she says.

Although multiplayer games and virtual worlds are clearly places for social networking, they have not become the target of legislation, as have other networking spaces like Myspace.com. Rep. Fred Upton, R-Mich., and others in Congress have proposed restricting children’s access to social-networking Web sites. Due to such efforts, as well as entertainment-industry threats to tighten copyright restrictions on kids’ variations of games or movies, MIT’s Jenkins fears that authorities will “shut down [digital media] before we understand them.”

Meanwhile, age, ethnic and social stratifications are breaking down as youngsters play online with older people from cultures around the world. “This is social broadening, which can be scary” to society, says the University of Illinois’ Williams. While mixing is positive for diversity, the bonds are different than with a face-to-face friend. “An online friend can console you but can’t drive you to the hospital,” he points out.
Libraries Log On

On Friday night each month, nearly 100 Michigan teenagers gather at the Ann Arbor District Library to compete in the Nintendo racing game “Mario Kart.” “It’s just like story-time, only noisier and smellier,” says the library’s technology manager, Eli Neiburger.

Libraries increasingly are offering such gaming events, and younger librarians are trying to persuade colleagues that video games are a legitimate part of libraries’ mission. A new Young Adult Library Services Association task force is examining whether to recommend video games for teens alongside its annual list of recommended books.

When kids ask, “What can I read?” librarians should give the answer a game spin, advises task force member Beth Gallaway, a trainer/consultant for youth services at the Metrowest Massachusetts Regional Library System in Waltham. “No matter what kind of game kids are playing, they come in genres just like the books we’re so familiar with — science fiction, fantasy — and you can pull out these elements from the game,” she says.

“There seems to be a lot of interest right now,” says Christopher Couzes, director of institutional marketing at Baker and Taylor in Charlotte, N.C., which sells books and other media to libraries. But so far, only about 200 libraries have purchased video games from his firm.

According to the University of Wisconsin’s Squire, nearly every student he’s met who has played a content-rich game like “Civilization” has checked out a library book on a related topic. But those mind-teaser games are not the games libraries are purchasing. “Libraries want to bring in titles that are popular and that circulate,” says Couzes, such as sports games and the popular “Mario Brothers.”

Saying Less?

Although no one knows for sure whether the rising use of video gaming is affecting national literacy and problem-solving abilities, the percentage of U.S. college graduates with proficient English literacy has declined — from 40 percent in 1992 to 31 percent in 2003.

Citing that decline, longtime technology critic Jeremy Rifkin, founder of the Foundation on Economic Trends, blames the increasing use of video games and other electronic media like TV and text messaging. “The human vocabulary is plummeting all over the world, making it more difficult to express ourselves,” he says. “It appears that we are all communicating more, but saying less.”

However, science writer Johnson observes IQ scores in most developed countries have increased over the past century. He also notes the rate of increase has accelerated in the past 30 years and attributes the rise to the increasing cognitive labor in our mental diet. Compared to the simple children’s games of a century ago, today’s 10-year-old must master “probing and telescoping through immense virtual worlds,” switching from instant-messaging to e-mail and troubleshooting new technologies, Johnson writes. The fact that the U.S. lags behind other countries in educational assessments just shows that students are getting their IQ advantage outside of school, he argues.

A Federation of American Scientists report recently called on the federal government to research the education and work-force-training potential of video games. The report followed a yearlong evaluation and conference sponsored by the National Science Foundation, which is funding projects to develop educational science games, including multiplayer online games.

While video games could improve learning and motivation, the scientists’ report said most commercial games probably will not accomplish those goals, and more educational games should be developed. More research is needed to understand exactly which features of games are important for learning, it said.

High costs and an uncertain market make production of purely educational games too risky for private industry to develop, the foundation report said. While some classrooms already use games like “Civilization” for history, “SimCity” for urban planning and “Roller Coaster Tycoon” for physics, schools are unwilling to abandon textbooks and traditional teaching for games whose effectiveness is unknown. The scientists urged educators to develop educational materials around content-rich games like “Civilization” and develop tests to find out what students learn in games.

OUTLOOK

Testing the Hypothesis

As video games become more sophisticated and broaden their audience, some cultural observers say it’s time to look beyond fears of lurking pedophiles and rotting brains and conduct research to find out what’s genuinely good and bad about games.

In October the MacArthur Foundation announced it was committing $50 million to understanding how video games and other digital media affect learning by young people. The foundation is giving grants to game enthusiasts like Wisconsin’s Gee and Global Kids’ Joseph, as well as to skeptics like Harvard’s Gardner.

Unlike school, games are producing “kid-driven learning,” says Yowell, noting the foundation will fund innovations.
based on “what we learn from the kids.” MacArthur’s hypothesis is that digital media do affect how children learn. “That has huge implications for parents, teachers and policymakers, and we need to understand that,” Yowell says.

Edward Castronova, an associate professor of telecommunications at Indiana University, will use his $240,000 grant to build an online game around Shakespeare’s plays, then study how kids’ alter-egos dressed in 17th-century costumes learn the bard’s words and change their social behavior while living in a very different society. 69

Some of the enthusiasts’ biggest claims will be tested with MacArthur-funded research. Do kids experience failure differently in games? Are they problem-solving differently? What’s the effect of giving kids immediate feedback in a game? How do you test what they’ve learned in a game?

MacArthur grantees will also be asking some of the critics’ questions, such as: What’s being lost with all the time spent playing? Are players socially isolated? Are they daydreaming less? “We’re agnostic,” says Yowell.

At least one grant, to Gardner, will examine how kids make ethical decisions about what they share publicly in virtual worlds and multiplayer games, “If I get to pretend to be someone else, what does that mean about how I make ethical decisions?” Yowell asks.

Increasingly, much of our national political debate comes down to disagreements over whether a model is accurate: Will the Earth really suffer from global warming? Did the Iraq war reduce terrorism or stimulate more of it? Since games are all about testing models, they could provide a test-bed for citizenship. Increasingly, they’re also about collecting information from many sources — not just rote memorization from a central source.

The big question, enthusiasts say, is whether educators will adapt those techniques to make school as engaging and complex as the best video games. But can games move beyond blood and monsters to become socially positive? Global Kids thinks so and has developed a game about poverty set in Haiti. In a family’s struggle to survive, the player has to choose between sending the children to school (and going into debt) or sending them out to work and reaping short-term additional income. 70

Yet will these kinds of games fly with children who’ve grown up on the thrills of “Grand Theft Auto”? It’s hard to predict, especially as games become ever more realistic and thrilling in this fast-changing industry.

One of the more futuristic visions foresees virtual characters who can respond emotionally to players. “Laura,” a computerized exercise trainer developed at MIT, provides empathetic verbal and facial feedback. To technology critic Rifkin, it’s hard to know whether to see such attempts as “sadly pathological . . . or whether to be truly frightened.” 71

Ultimately, says MIT’s Jenkins, video games are not simply an add-on to mainstream education but a “basic paradigm shift” in how kids learn — one that’s here to stay. Parents will have to be actively involved in the digital world to understand it and offer guidance, he says — whether it’s questioning the ethics in Second Life or steering kids to the fanfiction sites where they can learn to become better writers.

His advice to parents: Sit down and play a game with your kids. 72

Notes

2 Steven Johnson, Everything Bad is Good For You (2006), p. 45.
3 Ibid., p. 31
6 Kaiser Family Foundation, op. cit.
8 FAS, op. cit.
11 Galas and Ketelhut, op. cit.
12 Federation of American Scientists, op. cit., p. 45.
14 FAS, op. cit.

About the Author

Sarah Glazer, a New York freelancer, is a regular contributor to the CQ Researcher. Her articles on health, education and social-policy issues have appeared in The New York Times, The Washington Post, The Public Interest and Gender and Work, a book of essays. Her recent CQ Researcher reports include “Increase in Autism” and “Gender and Learning.” She graduated from the University of Chicago with a B.A. in American history.
17 www.nickyee.com/daedalus.
21 Yee, op. cit., p. 68.
22 Ibid.
23 John Seely Brown and Douglas Thomas, “You Play World of Warcraft? You’re Hired,” Wired, April 2006, p. 120.
24 Ibid.
26 Ibid., p. 42.
27 Yee, op. cit., p. 69.
32 Ibid.
35 James Gee, What video games have to teach us about learning and literacy (2003), p. 48.
37 Ibid.
38 Ibid.
41 Ibid., p. 6.
43 For background see Brian Hansen, “Cyber-Predators,” CQ Researcher; March 1, 2002, pp. 169-192.
47 Kaiser Family Foundation, op. cit., March 9, 2005, p. 17. Boys spend an average of 1 hour 12 minutes a day compared to girls’ 25 minutes.
52 Ibid.
53 Ibid.
54 Ibid.
55 Suellentrop, op. cit., pp. 16-17.
56 Beck and Wade, op. cit., p. 3.
57 The NPD Group, Point-of-Sale Information.
60 Pew Internet & American Life Project, op. cit.
61 Ibid.
66 Steven Johnson, Everything Bad is Good for You (2006), pp. 142-144.
71 Rifkin, op. cit.
72 MacArthur Foundation Webcast, op. cit.
Books


Two business experts argue video games provide the kind of leadership, entrepreneurship and team-building skills needed for today's workplace.


An education professor at the University of Wisconsin-Madison argues that video games provide an intricate learning experience in a modern world where print literacy is not enough.


Science writer argues that gamers are learning the scientific method when they try to figure out the “physics” of a game.

Prensky, Marc, *Don’t Bother Me Mom-I’m Learning!*, Paragon House, 2006.

In this enthusiastic book, the founder of an e-learning company urges parents (whom he calls “digital immigrants”) to start engaging with digital natives — kids who’ve grown up with games as a positive learning experience.

Articles

Brown, John Seely and Thomas Douglas, “You Play World of Warcraft? You’re Hired!” *Wired*, April 2006, p. 120.

Skills learned in multiplayer games like “World of Warcraft” are training young people for workplace leadership roles.


The future of video-game technology includes interactive dramas and Spore, a game coming out next year, that will give players new scope in designing new worlds.


Technology critic worries that the nation is becoming less literate as video games proliferate, and expresses disgust at futuristic interactive computer characters.


University of Wisconsin educational researchers argue that video games offer “learning by doing” on a grand scale and that schools need to catch up.


The popularity and economies of virtual worlds like Second Life are growing rapidly.


A New York Times columnist suggests games do not permit innovation because they force players to play within the system.


So far, research on the effect of violent video games and other media on children only shows evidence of short-term effects.


The creator of “The Sims,” the best-selling PC game of all time, argues that gamers are learning in a “totally new way” and “treat the world as a place for creation.” As guest editor, he invited other authors to write about the future and impact of video games for this special issue.

Reports


After a yearlong study, the federation recommended that the federal government fund research into the most effective educational features of video games and help develop new educational games.


MIT’s Jenkins and other technology experts argue that involvement in digital media has given young people new skills and new scope for creativity, and they urge schools to do more to foster “media literacies.”


More than 80 percent of adolescents have a video console player at home, and the amount of time spent playing video games has increased in the past five years.


The vast majority of U.S. teens use the Internet and 81 percent of those play games online.
Addiction and Video Games

Experts debate whether an obsession with video games can actually be labeled an addiction.

Curley, Fia, “Video-Game Addicts Log In At Detox Clinic,” The Houston Chronicle, June 18, 2006, p. 4.
An addiction center in the Netherlands is opening Europe’s first detox clinic for video-game addicts.

Benefits of Video Games

Some physicians and psychiatrists believe video games can be used as tools to boost fitness and knowledge.

James Clarence Rosser Jr. believes the manual dexterity that video games require also makes for a good surgeon.

Video games can help children and adults diagnosed with attention-deficit disorder (ADD) learn to focus.

Industry Trends

A growing number of colleges are offering classes in video-game design as a result of a booming video-game industry.

A growing number of video-game makers are aiming at children as young as 3.

The Urban Video Game Academy is teaching minority teens about game design to expose them to the possibility of careers in the multibillion-dollar field.

Learning and Video Games

Many child-development experts are skeptical that preschool video games are actually educational.

Scientists called for federal research into how video games can be converted into serious learning tools for schools.

Video games are becoming increasingly popular among teachers in physical education, social studies and history.

Violence and Video Games

Some experts say video games like “Darfur is Dying” can be used to raise humanitarian awareness.

Children with a preference for violent video games demonstrated lower empathy than their peers.

Gov. Arnold Schwarzenegger, R-Calif., signed a bill that bans the sale or rental of extremely violent video games to children under 18 without parental approval.

Max Aberle spends several hours a day in front of the television destroying bad guys on video games, exemplifying the new American childhood.

CITING CQ RESEARCHER
Sample formats for citing these reports in a bibliography include the ones listed below. Preferred styles and formats vary, so please check with your instructor or professor.

MLA STYLE

APA STYLE

CHICAGO STYLE
For 80 years, students have turned to CQ Researcher for in-depth reporting on issues in the news. Reports on a full range of political and social issues are now available. Following is a selection of recent reports:

**Civil Liberties**
- Voting Controversies, 9/06
- Right to Die, 5/05
- Immigration Reform, 4/05
- Gays on Campus, 10/04

**Crime/Law**
- Sex Offenders, 9/06
- Treatment of Detainees, 8/06
- War on Drugs, 6/06
- Domestic Violence, 1/06
- Death Penalty Controversies, 9/05

**Education**
- Academic Freedom, 10/05
- Intelligent Design, 7/05
- No Child Left Behind, 5/05

**Environment**
- Biofuels Boom, 9/06
- Nuclear Energy, 3/06
- Climate Change, 1/06
- Saving the Oceans, 11/05
- Endangered Species Act, 6/05
- Alternative Energy, 2/05

**Health/Safety**
- Rising Health Costs, 4/06
- Pension Crisis, 2/06
- Avian Flu Threat, 1/06
- Domestic Violence, 1/06

**International Affairs/Politics**
- Understanding Islam, 11/06
- Change in Latin America, 7/06
- Pork Barrel Politics, 6/06
- Future of European Union, 10/05
- War in Iraq, 10/05

**Social Trends**
- Blog Explosion, 6/06
- Controlling the Internet, 5/06

**Terrorism/Defense**
- Port Security, 4/06
- Presidential Power, 2/06

**Youth**
- Drinking on Campus, 8/06
- National Service, 6/06
- Teen Spending, 5/06
- Bullying, 2/05
A woman in New York City logs onto her Facebook account to contact other Mob associates. With their help, she plans a bank heist, purchasing weapons and a getaway car. A criminal? Not exactly; she is playing “Mafia Wars,” an Internet-based “social game” — the most recent development in the evolution of video games and already a core online activity.

Just four years ago, social gaming existed only in the imagination of a few software developers. Today such games — accessed mainly from widgets on Facebook and My Space — are played by some 275 million monthly active users (MAUs) in the United States and have transformed the demographics of video gamers.

When “Empires and Allies” — in which players build idyllic island nations and defend them from rival nations — was released in June, it became an instant mega-hit, quickly acquiring 21 million MAUs. Zynga, the San Francisco-based social network game developer that created both “Empires and Allies” and “Mafia Wars,” earned an estimated $500 million in revenues last year.

Social gaming is growing so rapidly that — if it hasn’t already — it could soon overtake the other recent gaming development: massively multiplayer online games (MMOs), which can involve thousands of players simultaneously. At its peak in July, “The World of Warcraft,” considered the most popular multiplayer game, had 12 million regular players. That’s a drop in the bucket, however, compared to the more than 200 million people playing social games. In fact, the active user base for social games is growing faster than Facebook itself.

Wild Ride

“What has happened since (Mark Zuckerberg launched Facebook in 2007) has been a wild ride,” writes Mike Sego on Gamezebo.com, a video game news website. “There was the rush of . . . the early pioneers who began creating what we know now as ‘social games.’ . . . There was the stratospheric rise of Zynga, the company that proved that social games could grow to a scale where no games have gone before.”

Seemingly immune from the recession, U.S. video game sales topped 298 million units in 2008, totaling $11.7 billion in revenue ($21.4 billion when gaming hardware is included). The following year total sales dipped to $19.6 billion, mainly because gamers bought fewer consoles, reflecting the shift to online gaming, which requires no special hardware other than a computer or a “smart” phone. But sales bounced back to $24.7 billion in 2010 as social gaming and MMOs gained a firm foothold. Market analysts forecast global sales of $91.96 billion by 2015.
Subsidies Questioned

But in a climate of intense public concern over the need to cut government spending, questions are being raised about the generous tax breaks, write-offs and credits enjoyed by the booming industry. The New York Times recently called it “the most highly subsidized business in the U.S.”

Video game makers, like other high-tech companies, benefit from a variety of tax incentives aimed at advancing American technology and creating jobs. Plus, the companies shield large profits by investing them overseas. Industry officials say all the tax loopholes are legal, and that video game makers are not as aggressive in seeking such breaks as other businesses.

Shifting Demographics

Experts say the staggering sales and revenue numbers reflect a long period of change in the industry, which is now coming to an end — both in terms of its delivery systems and in the fact that the market is no longer youth-dominated. Adolescents don’t always stop playing video games as they grow older — and social gaming has shifted the demographics significantly. The average age of video players is now 34. More than 90 percent of American adolescents are still regular players, but they make up less of the total. The Entertainment Software Association, representing video game makers, says 44 percent of all players are between the ages of 18 and 49, and 25 percent are 50-plus.

Violent Content

Yet, plenty of controversy still surrounds video games, especially concerning their impact on adolescents. After years of debate, including in Congress, no laws exist to counter the possible impact of violent content on young players of games such as “Grand Theft Auto.”

A few states enacted a series of laws over the years making it a criminal offense to sell violent video games to minors. Those laws were struck down last June when the Supreme Court overturned a 2005 California ban on sales of violent video games to children, ruling that the law violated First Amendment rights to free speech.

In the majority opinion, Justice Antonin Scalia wrote, “A state possesses legitimate power to protect children from harm . . . but that does not in-
include a free-floating power to restrict the ideas to which children may be exposed.”

Victor Strasburger, a professor of pediatrics at the University of New Mexico, Albuquerque, submitted expert opinion to the court supporting the California law. “By any objective standard, video games have become more violent and more sexual, yet the Congress has never allocated any funds for research on the influence of these games on children who spend seven to 12 hours a day playing them,” he says. “We completely missed the boat here. We need ongoing studies by the National Institutes of Health, and we don’t have them.”

The industry rejects the idea of a link between violent games and adolescent violence, using the same argument — insufficient research. The website of the Entertainment Software Association claims, “There is no scientific research that validates a link between computer and video games and violence, despite lots of

Chronology

2007

July — Three Internet entrepreneurs — Mark Pincus, Scott Sale and Kyle Stewart — founded Zynga, a San Francisco-based social network video game developer; the company immediately launches its first game, “Zynga Poker.”

2008

April 29 — Rockstar Games releases “Grand Theft Auto IV”; more than 6 million copies are sold in the first week.

Oct. 17 — Sony Corp. recalls its newly released game “The Little Big Planet” because verses from the Koran can be heard in the background music. Sony apologizes to Muslims and re-releases the game with new music.

2009

Oct. 12 — China bans foreign companies from investing in the country’s lucrative video game industry “in any form,” as a leading market intelligence firm forecasts that industry revenues in China alone would reach $3.65 billion for the year.

Dec. 30 — An independent survey reports that employment in the video game industry improved marginally, despite rising unemployment nationwide. At the close of 2009, the industry’s active work force totaled 44,806 — up about 400 from 2008.

2010

June 12 — Europe’s troubled economies and a serious problem with piracy lead to declining sales in video games. In Spain, for example, sales drop 5.4 percent, to around $1.4 billion.

Dec. 7 — Blizzard Entertainment releases “World of Warcraft Cataclysm,” the fourth expansion of the hugely successful Warcraft franchise.

2011

Feb. 10 — The Smithsonian Institution in Washington invites the public to nominate video games for its forthcoming exhibition on video game graphics; the huge response crashes the museum’s server. The exhibit, “The Art of Video Games,” opens on March 12, 2012.

June 1 — The Warcraft franchise becomes the world’s most subscribed massively multiplayer online role-playing game, with 11.1 million subscribers (users); but social games like “Mafia Wars” have bigger numbers.

June 27 — U.S. Supreme Court strikes down as unconstitutional a California law making it a criminal offense to sell violent video games to minors. Similar state bans also are successfully challenged.

Aug. 11 — Zynga games on Facebook reach 275 million monthly active users.
overheated rhetoric from the industry's detractors."  

Critics also blame habitual gaming for child obesity, anti-social behavior and such physical ailments as “nintendinitis,” a repetitive strain injury to the thumbs. And a report by an American Medical Association (AMA) panel said 15 percent of U.S. youngsters who regularly play video games may be addicted.

But, video games can divide expert opinion: Despite the AMA report, the American Psychiatric Association has said it will not classify video game addiction as a mental disorder in the 2012 edition of its influential Diagnostic and Statistical Manual of Mental Disorders. The group does, however, encourage “further study.”

**Favorable Views**

The flip side of these concerns is the favorable view that video games are motivating and mentally challenging and improve both multitasking skills and manual dexterity. “Scientists find action gamers apparently are better at making quick and accurate decisions, ones based on details they extract from their surroundings,” according to science writer Charles Q. Choi in *Live Science*. For example, in a study of laparoscopic surgeons, who perform minimally invasive surgery by manipulating camera-equipped robotic tools while looking at a live video screen, those who had played video games for at least three hours a week were 27 percent faster and made 37 percent fewer errors during surgery.

The academic world is skeptical that commercial video games are educational, but it increasingly uses video game technology to produce teaching material.

Chris Dede, the Timothy E. Wirth Professor of Learning Technologies at Harvard's Graduate School of Education, argues that killing dragons doesn't have much relevance in daily life. “People look at 'Spore' [a game about evolution on an imaginary planet] and say kids can learn biology from it,” says Dede, who heads a project using video game technology to create teaching materials. “I don't have anything against video games, but I get nervous when I hear claims like that made by manufacturers, because kids can learn bad biology from 'Spore.'

But Dede is not averse to using video game fantasy in the cause of better teaching and higher grades. In “TESLA,” his group’s latest multiplayer “game-like” simulation, a group of students, grades 5 to 8, are space explorers on an unknown planet; their captain is trapped in an ancient tomb, and the challenge is to set him free by solving several mathematical problems.

“TESLA” is an anagram for Transforming the Engagement of Students Learning Algebra.

Dede’s group is developing other games, but he won’t discuss them until they have been fully tested. “Only then do you know if it’s a golden goose,” he says.

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**Roland Flamini**

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**Notes**

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