



PhysTech

Naomi Dillon

Schools are turning to technology to improve student health and wellness

For today's students, technology has made life easier and more exciting. It has created more opportunities for learning. At the same time, the Internet, instant messaging, video games, and cellphones have contributed to a generation that is far less active and more obese than ever.

With health officials predicting a child obesity rate of 20 percent by 2010, the consequences of doing nothing are dire. Kids who are overweight or obese by the age 8 are 80 percent more likely to remain overweight or obese as adults.

So, for schools, the question is how to use the power of technology to drive students toward a healthier lifestyle. From pedometers and heart rate monitors to computerized assessment programs and video exercise games, more and more educators are exploring and turning to technology to improve the health and wellness of their students.

"Right now people appreciate the fact that we have an obesity issue, that there is a relationship between physical activity and cognitive ability," says Bonnie Mohnsen, who operates a California-based online business that provides schools with technology tools to improve physical education programs. "We could have someone incredibly intelligent and well-educated but if they die of coronary heart disease at 25, what good would we be doing as a school system?"

Make it matter

Mohnsen's career began well before educators thought about using technology to stimulate learning. A former P.E. teacher, she has witnessed the evolution that now incorporates technology as a viable teaching instrument.

"Historically, the first use of technology in physical education was for fitness reporting," Mohnsen says. "So you would assess students, input the data, and print out a report."

Data collection has long been one of the most popular uses of technology among physical education teachers. By and large, the process is essentially the same, but the equipment has become more sophisticated, the criterion for the data has changed, and the results are viewed and developed by more than just teachers.

"In the old days, almost everybody used the Presidential [Fitness Test]," says Phil Lawler, director of instruction and outreach for the child fitness advocacy group PE4life. "So they used to compare everybody to everybody in class. If you

were an athlete, great, but there wasn't a lot of incentive if you're weren't."

Today, Lawler uses software programs and systems like the FITNESSGRAM and Tri Fit to gather and track extensive data. Standards are based on good health, not athletic ability.

"When our seniors graduate, they get a 25-page printout of their health profile going all the way back to the fourth grade," says Lawler, who directs a PE4life training facility at a suburban Chicago middle school. "Hydration level, blood pressure, family history, nutrition analysis, cholesterol screening. We definitely saved some young people."

Conversely, it was a somber day in 2000 when Greg Howit saw that he and other educators were not doing enough to save the next generation from an unhealthy and ultimately deadly lifestyle. The federal government had just released a report that detailed the rising rates of diabetes, hypertension, and heart disease—chronic diseases linked to inactivity and poor nutrition.

"I realized we had failed. As a nation we were failing," says Howit, a P.E. teacher at Don Juan Avila Middle School in southern California. "We'd been doing what we thought was a

good job and we weren't."

As luck would have it, Howit was being transferred to a new school to build a quality physical education program from the ground up. He began with his own philosophy on physical fitness.

"The reason we failed was because students should've been responsible for their own health. They need to know, 'How do I get well and fit and how do I stay well and fit for the rest of my life?'" Howit says. "We needed to start relying on heart rate monitors and the ability to graph results so we could show improvement and progress. The only way we could do that was through technology."

Since then, Howit has snagged a number of grants, donations, and funds from local and national sources, enabling him, among other things, to e-mail daily fitness reports to parents.

"This is not something you just throw out there," Howit says. "We've had to change paradigms. We've managed to change the way we deliver physical education."

Make it personal

The value of collecting and reporting data has never been as

Concussion testing makes an ImPACT

Technology has become a powerful tool to get students moving. Perhaps more importantly, it is being used to diagnose student athletes halted by one of the most mistreated sports injuries: concussions.

Current estimates peg the number of sports-related concussions at 1.6 million to 3.4 million annually, with the majority occurring at the high school level. It's difficult to tell if even that broad range is accurate, but a computerized evaluation system known as ImPACT is revolutionizing the way concussions are identified and treated.

Part of the problem is concussions can be tricky to detect. Unlike structural damage to the brain, like a fracture or hemorrhage, which can be picked up by a CT scan or MRI, concussions are metabolic changes that impact the way the brain functions and often don't appear on diagnostic tests.

Symptoms can be subtle and varied, ranging from headaches and forgetfulness to nausea and sluggishness. And contrary to popular belief, a person

doesn't have to be knocked unconscious to have sustained a concussion.

ImPACT, which stands for Immediate Post-concussion Assessment and Cognitive Testing, measures students' reaction time, memory, and attention span. Athletes typically take the 20-minute test at the start of the season so a baseline can be recorded and compared against when a concussion is suspected.

Perhaps the biggest impediment to proper diagnosis, however, is the athlete. "Every single day, I see athletes trying to minimize their problems and it's futile because ImPACT is a tool that helps hold the athlete accountable," says Mickey Collins, assistant director of the University of Pittsburgh Medical Center's sports medicine concussion program and a co-developer of ImPACT.

Imagine the brain is like the yolk in an egg, Collins says. When it is shaken violently, which is what a concussion is, it alters the brain chemistry and the true extent of the damage can only be determined by putting the brain to work. Im-

PACT, he says, is designed to be "a physical for your brain."

The technology is making an impact (pardon the pun) in schools. At Munster High School in Indiana, all students—not just the athletes—take the test.

"That was a commitment on the part of our administration and school board because we have the kids in P.E. and the kids have the same risk for getting a concussion in class," says John Doherty, the head athletic trainer and personal trainer at Munster, which started using the program five years ago.

Parents now call the school to use the test on a child who has fallen down the stairs or been in a car wreck. Doctors were skeptical at first, Doherty says, but now they believe in the technology.

"In the first year, I had a neurologist throw the results to the side and say, 'What is this?'" Doherty says. "But I now get 100 percent support from local doctors with ImPACT. I've even had a couple doctors call me and say, I want to talk to you about the results because you're the expert."

From the popular pedometer to the cutting-edge heart monitor, devices can provide instant feedback to both the instructor and student.

high in education as it is now. You know the drill: Data drives decisions. But irrelevant and outdated data can be as useless as having no data. From the popular pedometer to the cutting-edge heart monitor, devices can provide instant feedback to both the instructor and student.

"I can still remember the day and the young girl," Lawler says of a sixth-grader who ran the mile in 13.5 minutes. "She wasn't overweight or asthmatic, just not fit."

In the old days, Lawler says, he would have used a stopwatch to judge the girl against national time and distance norms. By those measurements, he would have failed her. But when he downloaded her data, the girl's heart rate registered at 183 beats per minute, rising dangerously to 207 when she ran.

"I said, 'We're getting more of these,'" Lawler says. "And you know, as we speak, there are thousands of P.E. instructors evaluating kids based on observation and they have no clue."

Heart rate monitors can be pricey, which is why the pedometer has enjoyed widespread popularity in schools. At Sterling City Elementary School in Texas, students have measured their miles in a virtual walking tour across the United States.

"We've hiked across America for the past five years. Today, we're in St. Paul, Minn., [and] by May, we'll have gone across the country," says P.E. teacher Amanda Krejci.

Krejci uses a pedometer to calculate how many steps the journey would actually take. Her students trace their progress across a map, learning geography and state facts along the way.

As the recipient of the highly competitive Physical Education for Progress (PEP) grant, Krejci used the funds to purchase pedometers and heart rate monitors, the latter of which scared her at first.

"I floundered with them for awhile; I'm not tech savvy," she says. "For the guys that are, they are running with this, but I'm struggling to use this. But I want to use it and that's why I keep trying."

Indeed, Krejci has pushed herself out of her comfort zone and tried new things like video exercise games and handheld computers, which allow her to download and view how hard students are working in real time. She says she'll try anything as long as it makes her a better instructor and helps her students become healthier.

"I think back on my years of teaching, I've learned so much," says Krejci, who has been a teacher for 30 years. "Everything was done in lines, in perfect rows, but if you come to my class today it's not like that. We are all scattered about, working on our own goals."

Make it fun

As he strolled through a mall one day, George Graham, a kinesiology professor at Penn State University, walked past an arcade and saw a large group of youngsters crowding around a video game called Dance Dance Revolution, or DDR.

Immediately, a light bulb went off. He later coauthored a study that measured the heart rates of kids playing the inter-

active game, which has players use their feet to dance to popular music.

The findings were promising. "It not only looks like a workout, it is a workout," he says.

Video games have been long been blamed for a corresponding lack of exercise among youth. But a new generation of video games, called exergames, may have detractors singing a different tune.

Through the use of these exergames, participants can play baseball, box, or bike the Tour de France. The possibilities are endless, exciting, and coming to West Virginia's 765 public schools. While the state's plans, the result of a multiyear study by West Virginia University, are the most extensive, West Virginia is not

alone. Several hundred schools in at least 10 other states use DDR as a part of their physical education program. It's anybody's guess how many others use other forms of exergames.

Craig Buschner, president of the National Association for Sport & Physical Education, is ambivalent about the trend.

"Those aspects of technology where you can look at heart rates, count steps, and help teachers manage data collection, those are all good parts of technology," says Buschner, a kinesiology professor at California State University in Chico. "The big separation is when we step over the line, when interactive games become sort of frivolous and amusement versus having that real focus on learning and helping the teacher to manage learning."

But Mohnsen wonders, what's wrong with having fun?

"Exercise can be boring and routine," she says. "So why not motivate (students) to move the body by playing a game? I don't see a downside to that, especially as prices come down."

Opinions are still varied, however, on the role of exergames in physical education. Toward this end, the Robert Wood Johnson Foundation has committed nearly \$10 million to study how video games can improve the health of children and adults.

Still, as the price of technology comes down, new developments continue to hit the scene all the time. In addition to getting you to move, some video games now teach the proper form and technique on how to hit or throw balls for instance. Good, bad, or questionable, it's clear technology has made some inroads in physical education.

"I think about how my presentations have changed over the years," Mohnsen says. "In the beginning, I was trying to convince people to see technology as worthwhile. Now they want to know what's next." ■

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