

No Lectures or Teachers, Just Software

By JOSHUA GREEN

THE red phone on your desk rings in the middle of the night. The voice you hear is that of the White House chief of staff, alerting you to a crisis in the Eastern European country of Krasnovia. You're needed at the White House, pronto. "We'll send a limo," he says, and hangs up. After an emergency meeting with the president, you're given a classified intelligence report and access to the country's foremost diplomats, policy analysts and military leaders. You are to submit a report in time for a presidential address that evening. The president is waiting to act on your recommendation.

This is high school, circa 2010.

The scene is from an interactive software course, *Crisis in Krasnovia*, that its creator, Roger C. Schank, believes will revolutionize how children are taught.

"Software is going to replace classes as we know them," said Dr. Schank, director of the Institute for Learning Sciences at Northwestern University. After a career studying artificial intelligence at Stanford and Yale, Dr. Schank has shifted his sights from teaching computers to teaching students. In 1995, he founded Cognitive Arts, a company that is exploring commercial uses of software-based teaching.

A critic of traditional teaching methods, Dr. Schank wants to use technology to overhaul the entire educational system. "The computer is our Trojan mouse," he said. "It allows us to get our foot in the door to do something radical and difficult."

Through the Institute for Learning Sciences and Cognitive Arts, Dr. Schank and his staff have developed more than 100 programs, many of them, like *Krasnovia*,

Academic 'courses' that resemble video games based on the real world.

purely for learning research. But the company has also created courses for clients like Arthur Andersen, the Environmental Protection Agency and the United States Air Force.

Dr. Schank is marketing his courses to universities and believes they will be attracted by the potential savings and by the program's academic pedigree. In May, Cognitive Arts announced it would join with Columbia University to develop 80 software-based courses that correspond directly to existing Columbia courses. In June, Harvard Business School said it would begin offering pre-enrollment software courses designed by Cognitive Arts to students who had been accepted for enrollment.

Dr. Schank's programs combine the look of high-tech video games with a Mission Impossible-style narrative. A course in biol-

ogy, for instance, might challenge students to stop a worldwide virus outbreak; an economics course might have them play the role of adviser to the chairman of the Federal Reserve; a physics course might entail building a rocket and landing it on the moon. In essence, each software course is like an elaborate choose-your-own-ending novel.

The aim is to get students to delve into a course's volumes of academic information, including hours of videotape of experts in a field related to the program. Students running *Krasnovia*, for example, can draw on video advice from Thomas Boyatt, a former ambassador, and Bruce Laingen, an American diplomat who was held hostage in Iran and is president of the American Academy of Diplomacy.

Rather than subject students to full-blown lectures, Dr. Schank breaks the video into snippets that address only the question at hand. He believes students learn more effectively through this piecemeal approach, which he calls "just in time" learning.

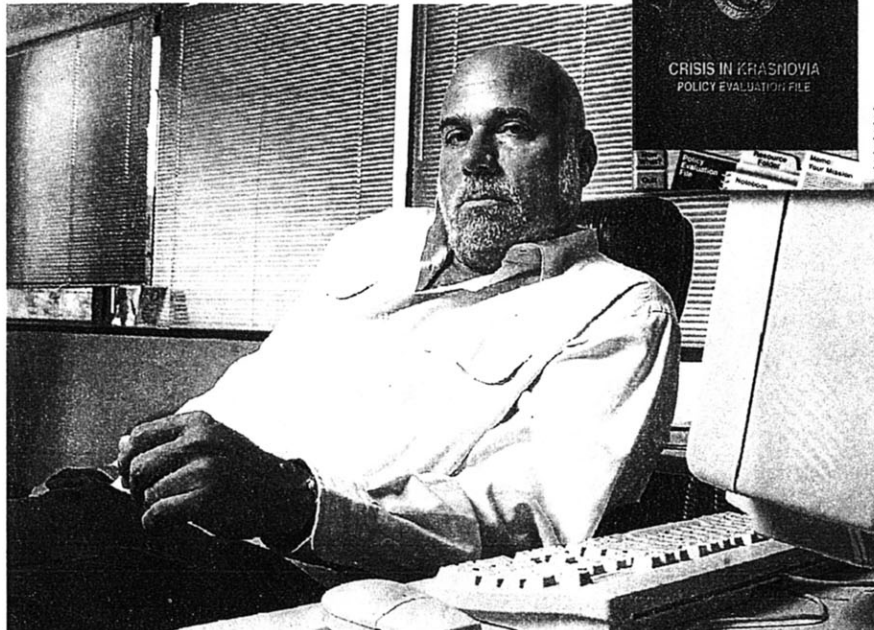
"The value of the computer is that it allows kids to learn by doing," he said. "People don't learn by being talked at. They learn when they attempt to do something and fail. Learning happens when they try to figure out why."

Bald, bearded and powerfully built, Dr. Schank's appearance and demeanor suggest Marlon Brando in the movie "Apocalypse Now." His professional reputation is somewhat similar. His brusque manner and outspoken criticism of those he disagrees with have alienated some colleagues and earned him the reputation of iconoclast. But his success in designing teaching software has made him a much sought after figure among businesses, military clients and universities.

His company puts extraordinary effort into creating software courses, each of which can take up to a year to design and can cost up to \$1 million. Video is an important component of Dr. Schank's program. After interviewing professors, his staff develops a story, writes a script, hires professional actors and begins filming. Cognitive Arts even arranged the use of CNN footage of the Bosnian conflict to lend the aura of authenticity to *Crisis in Krasnovia*.

The programs allow students to progress at their own pace. Dr. Schank says the semester system is badly outdated, a view he also holds for most tests, which foster only temporary memorization, he says. His programs require students to write detailed reports on what they have learned. A student who cuts corners does not finish the course, and the failing grade is delivered in the spirit of a video game. In *Krasnovia*, for instance, an incomplete report would draw a mock newscast in which commentators ridicule the president's address. Students must then go back and improve their work.

These multimedia simulations differ radically from current online offerings. "When you look at online courses now, what do you see?" Dr. Schank said. "Text online with a quiz. We're not taking a lecture and putting



Todd Buchanan for The New York Times

FOMENTING REVOLUTION
Dr. Roger C. Schank and his company design interactive software courses like *Crisis in Krasnovia*, above, for schools and businesses. "The computer is our Trojan mouse," he said. "It allows us to get our foot in the door to do something radical."

it on screen. We're restructuring these courses into goal-based scenarios that will get kids excited."

Dr. Schank says that such courses will render traditional classes — and many professors — obsolete. "The idea of one professor for one class is ancient," he said. "New technology is going to give every student access to the best professors in the world."

But many academics dismiss Dr. Schank's prediction that traditional teaching methods will soon become obsolete and question software learning's pedagogic value. "Education depends on relationships between people," said David F. Noble, a history professor at York University in Toronto and a critic of online learning. "Interactive is not the same as interpersonal. What Schank doesn't recognize is that teaching is not just about relaying knowledge."

Others warn against accepting radical new technology without pause. "The American university system is a highly functional institution," said Phil Agre, an associate professor of information studies at the University of California at Los Angeles. "The danger is that we will apply overly simplistic ideas about technology and tear apart the institution before we really know what we're doing."

Another assessment of the value of Dr. Schank's work is offered by Prof. Howard

Nusbaum, chairman of the psychology department at the University of Chicago. "Schank's idea in principal is a very sound one," Professor Nusbaum said. "But in the case of software learning, its success or failure will depend on implementation more than theory."

Several of the country's top universities are experimenting with ways to implement new technology-based teaching methods. Seymour Papert, a professor at the Massachusetts Institute of Technology's Media Laboratory, was among the first to advocate computers as teaching tools.

"The world is changing so fast that the concept of schools teaching people what they need to know is no longer viable," Dr. Papert said. "We're moving into a time when people need to know how to learn things they weren't taught in school. Second, we now have the technology to let kids learn better. This will not just allow them to learn the same things better; it will teach kids to learn radical new things at all ages."

Mitchell Resnick, another professor at M.I.T.'s Media Laboratory, said: "Computers offer kids multiple ways to learn, where in the past there was only one way. Ultimately, you want kids to have a tool chest of different options they can bring to bear when solving problems."

But new technology also threatens to exacerbate current inequities. Dr. Resnick

worries that the so-called digital divide will not be one of access to computers but a "fluency gap" between those able to use them for learning and those who merely use them to play games.

Dr. Schank does not think his programs will be a victim of the digital divide. He believes that poorer schools are likely to benefit first from his programs. Top high schools "don't want this — their kids get into Harvard," he said.

"But poorer schools," he continued, "aren't going to turn down a college level software course that's endorsed by Columbia."

Dr. Schank pointed to the example of the Daniel Jenkins Academy, a public high school in Polk County, Fla., a poor district that will switch to online teaching this fall. Students will gather in classrooms where they will take Web-based classes on computers. They will be taught remotely by teachers working from their homes. Dr. Schank suggested that once disadvantaged students began outperforming those from better schools, many long-held assumptions about teaching will go the way of the slide rule.

"We have a whole country of people who agree on education, and they're all wrong," he said with characteristic bluntness. "School just isn't that relevant anymore. We'll make it relevant. We're trying to overthrow the system."