

UCF physicist says Hollywood movies hurt students' understanding of science

Movies such as Spiderman 2 and Speed generate excitement among audiences with their cool special effects. But they also defy the laws of physics, contributing to students' ignorance about science.

Two University of Central Florida professors show just how poorly Hollywood writers and directors understand science in an article published in the German journal "Praxis der Naturwissenschaften Physik." Common sense may indicate that people should know the stunts in movies are just make believe, but the professors say that's not necessarily true.

Some people really do believe a bus traveling 70 mph can clear a 50-foot gap in a freeway, as depicted in the movie Speed. And, if that were realistic, a ramp would be needed to adjust the direction of motion to even try to make the leap, said UCF professor Costas J. Efthimiou, who co-authored the article.

"Students come here, and they don't have any basic understanding of science," he said. "Sure, people say everyone knows the movies are not real, but my experience is many of the students believe what they see on the screen."

And that's not just a UCF problem. Efthimiou said students across the United States seem to have the same challenge with science. It starts young.

The Science and Engineering Indicators 2006 report seems to support his observations. The report shows that the average science scores among 12th graders in the U.S. dropped from the previous year. The scores remained stagnant in the fourth and eighth grades. Worse, only about one-third of all students tested were proficient, meaning they had a solid understanding of what they should know.

If youngsters aren't getting the basics at the elementary level, it becomes very difficult for them to continue to study the subjects in college and virtually impossible for them to make significant contributions to the scientific community, Efthimiou said.

Efthimiou began teaching a basic physics course at UCF in 2000. He described the experience as "horrible." The students feared the subject matter and complained his class was too hard. Instead of continuing with the standard fare, he approached former UCF physics chair R.A. Llewellyn. Together, they came up with the movie approach now known as "Physics in Film." They launched the course in the summer of 2002, and today it is among the most popular on campus.

"I needed a hook to get the students interested in science," Efthimiou said. "I needed something to get them beyond this fear. Now it is one of the most popular classes."

Efthimiou spends hours watching hundreds of films to find scenes that illustrate the physics concepts he needs to teach. For example, he uses a scene from Superman when the hero flies around the earth in an effort to reverse time and save Lois Lane from death. When students show up to class, they dissect the scenes and learn the real laws of physics. In the Superman example, he explains the real way angular momentum works.

"It's a lot of work, but it is worth it," he said. "It's a way to get them science literate."

Why would a veteran professor go through all of that trouble? Because he, like many scientists across the United States, is worried that if science and math education doesn't improve, society will pay the price.

“All the luxuries we have today, the modern conveniences, are a result of the science research that went on in the '60s during the space race,” Efthimiou said. “It didn’t just happen. It took people doing hard science to do it.”

The paper, “Hollywood Blockbusters: Unlimited Fun but Limited Science Literary,” is a direct product of the class he’s been teaching for five years. It’s loaded with physics, algebra and humor. But the message is clear. It’s time to get serious about science education.

Efthimiou, who has a doctorate from Cornell University, enjoys a good movie. But he said we should be as eager to get a good science education as we are to see the next big blockbuster.

Source: University of Central Florida

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