

Hello, and welcome to As It Is from VOA Learning English.

I'm Christopher Cruise in Washington.

Today on the program, we explore the complex and important world of engineering -- how people use science to solve problems or invent new things.

"Well I believe real engineers need to engineer things, need to envision what has never been, and to build things every semester."

We sent VOA Learning English Reporter Karen Leggett out to live in the engineering world. Over the past few months she interviewed officials at the National Academy of Sciences, an engineer at the U.S. Geological Survey, engineering educators and an engineering professor in India, among others. She learned how engineering students are being taught. Believe it or not, some of them are reading literature to help them learn how to become better engineers.

Now, back from the world of engineering, here is Karen Leggett.

## **The World of Engineering: Successes and Challenges**

Think about the great engineering successes of the 20th century. What would you include? We could start with airplanes. How about radio and television broadcasts or computers?

In 2008, the National Academy of Engineering asked a group of scientists, engineers and technology experts to identify the biggest engineering challenges for the 21st century. This group identified 14 big challenges or issues. They divided these issues into four subject areas: sustainability, health, reducing threats and joy of living.

## **The Joy of Living and Engineering**

Joy of living? What does that have to do with engineering? Rick Miller is President of the Olin College of Engineering.

"Well not everything that we think about going forward is a threat to the human race. Some of it is about joy and improving the quality of life. One of the things that is certainly true in the U.S. - and I believe it's increasingly true across the globe -- is the

expectation that every generation will have a quality of life that exceeds that of their parents.”

Mr. Miller says part of engineering today is about making life better. For example, engineers can help provide clean water for more people. Or they can improve medicines. Engineering can help us understand how the human brain works, and how every person can learn best. All these efforts are part of improving the quality of life. In other words, they help to increase the joy of living.

## **How Engineering Helps Make the World a Better Place**

Experts say engineering can help the world become safer and more efficient in the 21st century. They say engineers could design ways to prevent terrorists from using nuclear weapons. Or they could stop computer hackers from stealing information on the Internet.

Engineers can make it easier to use energy from the sun, or find new sources of energy.

Rick Miller says engineers have to work together to solve many challenges. The issues are too large and complex for any one

group of engineers -- or one country -- to solve alone. Mr. Miller says that when engineers from around the world cooperate, they can save the planet! But he says before engineers can start solving the world's problems they need to learn how to think creatively. His school -- Franklin W. Olin College -- was recently recognized for developing engineering leaders.

"Creativity is important to what we do. We look for students with multiple intelligences -- not just math scores. Olin believes that an engineer is a person who envisions what has never been and does whatever it takes to make it happen."

## **How Students Learn to Become Engineers**

Olin College is a small engineering school in the state of Massachusetts. Its students learn through creative projects. Mr. Miller says, for example, a student might design an insect such as a grasshopper. In five weeks, students have to create the design, build a model, and then compete to see whose "grasshopper" jumps the highest.

Olin College students also identify people they would like to help. Some students have invented ways to help older adults suffering

from memory loss. Others have created designs to help servers in coffee shops do their jobs better.

Mr. Miller says he wants his engineering students to work at being engineers -- just like art students practice making art.

“Real musicians need to play music every semester. And, in fact, it’s like oxygen. Well, I believe real engineers need to engineer things, need to envision what has never been and to build things every semester.”

## **Learning How to Use Engineering to Improve Lives**

Olin College is not the only school that teaches students how to think about engineering challenges. Pennsylvania State University offers what it calls the Humanitarian Engineering Social Entrepreneurship program -- in other words, students use engineering to improve people’s lives. In one project, students developed and tested low cost greenhouses in Kenya.

Greenhouses are used for growing plants. These enclosed areas give farmers a longer growing season.

Other college engineering programs are giving students a chance to create products and launch businesses before they finish their

education. For example, engineering students at Rice University in Texas have designed 58 health care products. The university says the products are now used to care for 45,000 patients in 21 countries.

## **High School Students Learn Engineering**

In North Carolina, classes at a new secondary school are organized around the grand challenges of the 21st century. Rob Matheson is head of the STEM Early College High School. STEM stands for the words Science, Technology, Engineering and Math.

“And what struck me as a science educator is that the challenges really cut across all of the basic sciences that we teach -- earth science, life and chemical. The answers to these big questions -- like access to clean water -- is in the humanities.”

## **Reading Literature to Become Better Engineers**

Rob Matheson’s students not only take engineering classes; they also study literature and history. He says students might read books like “The Boy Who Harnessed the Wind,” by William Kamkwamba. This book tells the true story of a boy in Malawi who built a windmill to bring electricity to his village. Another

assigned reading might be “Lord of the Flies,” by William Golding. The book tells about a group of boys alone on an island.

“They read ‘Lord of the Flies’ and then the project is, you know, ‘Imagine that you were, you crash-landed on this island and how are you going to sustain yourself? How are you going to provide the energy that you need?’”

Mr. Matheson believes students should learn early in their education to make connections between science and people.

“The question nowadays is what are you doing with your chemistry knowledge? What processes or product are you producing that is benefitting mankind as opposed to just, ‘I, I know my chemistry.’”

And that’s our program for today. It was reported, and written in Special English, by Karen Leggett.

Every day on As It Is, we report on issues that we believe are of interest to you as we help you learn everyday American English.



We present a new As It Is every day at 0030 Universal Time, with many rebroadcasts throughout the day.

Thank you for spending some of your time with us today.

I'm Christopher Cruise reporting from VOA Learning English headquarters in Washington.

June Simms will be here tomorrow with another edition of As It Is. I hope you'll join her then, here on The Voice of America.







## **Contact information for VOA Learning English:**

Postal address:

**VOA Learning English  
Room 3400  
330 Independence Ave SW  
Washington, DC 20237  
United States of America**

Email us at: [LearningEnglish@voanews.com](mailto:LearningEnglish@voanews.com)

Or go to our website -- [learningenglish.voanews.com](http://learningenglish.voanews.com) -- and click  
"Contact Us."

Follow us on Facebook, YouTube, LinkedIn, iTunes and Twitter at  
*VOA Learning English*

**<http://learningenglish.voanews.com/>**