

COOL Science

VLADO ZEMAN



“What is science?” I ask a Grade 10 high school class as they are in the midst of selecting their courses for next term, and in particular choosing whether or not to continue with science. I have come to talk to them about the intersection between science, technology, creativity, and our society, and to convince them that their science education needs to continue at least until the end of their high school years.

After a bit of bashful humming and hawing on their parts, I volunteer my answer: Science is the study of Nature. A very simple definition to a subject perceived by some as insurmountably complex. And as some students suffer from what we may call “science and math phobia”, we should remember the words of Marie Curie, one of only three scientists to have won two separate Nobel Prizes, “Nothing in life is to be feared; it is only to be understood.” That said, we should also embrace the notion that nothing is in fact completely understood; the ultimate origin of everything that we know is a complete mystery.

The demystification of science is one of those buzz phrases made popular by the notion that the general public feels more comfortable about complex scientific processes if they can relate them to something with which they already feel at ease. However, I prefer to re-mystify science. To not be consumed with providing easily digested explanations but rather to stop and admire the beauty of Nature. To look at the world through the eyes of a young child. To find wonder and mystery in everything around us. To marvel at the creativity of Albert Einstein.

“Imagination”, Einstein said, “is more important than knowledge.” While visiting with the high school students, I share that Einstein had a learning disability in mathematics. “How many of you are surprised at that?” I ask. Arms rise into the air as I admit to my own surprise when I first became aware of this fact.

I throw out to my class, “So how many of you think you will be employed in some sort of creative profession?” Slightly less than half respond yes. I gently inform the class that by the time they

are settled in their careers, any job that does not require creativity will be done by machines.

But contrary to popular misconception, sparks of creativity do not pop out of a vacuum. Highly creative people go through life with open and inviting minds and have stored in their brains countless bits of information, thoughts, and ideas. This mental cacophony churns away and sometimes a unique combination of brain waves gives rise to a novel concept. Creativity is not necessarily synonymous with an artistic endeavour – it is a method of using information, a mode of thinking.

“What is technology?” I ask. This seems to be a hard question because many people use the words “science” and “technology” interchangeably. When I say the word science, some people imagine a computerized gadget. When I say I’m a scientist, some people assume that means I can fix electronic devices. Many scientists of course can – especially those who are “applied scientists”, or engineers. Technology is defined simply as the

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application of science.

It is, after all, technology that connects abstract scientific theories to the practical devices we use in our daily lives. The leaves of technology grow from the roots of science. And it is precisely this, the infinite possibilities of future technologies, which fascinates most of us.

“Cool.” This is the sound I hear as I go through some of the more stunning predictions in the world of science and technology. From launching satellites with “space elevators” to viewing your personal genetic blueprint on a CD, imagination is gradually morphing into reality.

Science is neutral; it is simply the study of Nature, I remind my audience. But technology, as well as our knowledge of science, is heavily influenced by us, the human race. What scientists are allowed to study, and so what we as a society know about science, is influenced by our collective moral values. Should we be cloning human embryos? Should we develop more nuclear weapons? How should we respond to global warming? Should we take the human cloning claims of a religious

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cult seriously, even though CNN gave them an astounding amount of publicity? These are very serious questions that ought to be debated by a society that is scientifically literate. That means an education in science well beyond the Grade 10 level.

All in all, it seems impossible for us to arrive at the scientific truth since our perception of the truth is distorted through a human filter made up of scientists, journalists, politicians, religious leaders, and so on. Religion, in particular, has often been portrayed as being in conflict with science. It should be said, however, that in spite of this apparent conflict, the two disciplines share a very core value: their sincere quest for the ultimate truth.

I finish my presentation by highlighting the passion of the great scientists of the past and the importance of

passion in everyone’s life. Young people are full of passion and the Grade 10 class that I have been addressing is no exception. They have listened, asked questions, and expressed interest and fascination at the eye catching slides and thought provoking quotes I have shared with them. I believe they have received my message.

Science is discovery. Science is fun. Scientific literacy is crucial. Perceptions of science are distorted. Scientific knowledge can breed creativity. Science is mysterious. Science is cool. ★

VLADO ZEMAN, Ph.D., gives presentations on the virtues of science to high school students – for more information see www.vladozeman.com. He also teaches Light and Sound to Arts students in the Division of Natural Sciences at York University.

EN BREF « Qu’est-ce que la science? » Je m’apprête à expliquer aux élèves d’une classe de 10e année les convergences qui existent entre la science, la technologie, la créativité et notre société afin de les convaincre de poursuivre leur éducation scientifique jusqu’à la fin de leurs études secondaires, tout au moins. « La science est neutre, elle ne s’intéresse qu’à l’étude de la nature, tandis que la technologie et notre connaissance de la science sont fortement influencées par l’être humain », leur dis-je. « Ce que les scientifiques sont autorisés à étudier et ce que, par conséquent, la société connaît de la science est grandement influencé par nos valeurs morales collectives. »



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