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## Higher ed is in need of fresh ideas

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# Higher ed is in need of fresh ideas

Dr. Aldemaro  
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Letters from Academia

to study mathematics and physical sciences. He obtained very good training at both. One of his teachers was Christian Doppler, the discoverer of the Doppler effect.

However, Mendel never had training in biology. Yet, when he started to do his experiments with peas at the Brno monastery in what is today the Czech Republic, his mathematical training allowed him to visualize ratios in the characters that were being inherited by the plants he was cultivating.

That led him to present and publish in 1865 the hereditary laws for which he is famous today. Despite the fact that the journal in which he published his ideas was well-known at that time (Transactions of the Natural History of Brno) and that he sent copies of his papers to prominent botanists of his time, these naturalists had no training in mathematics and did not understand what he was trying to demonstrate.

It took 35 years (in 1900) for his work to be recognized by the scientific community. Here is a very good example of someone with an entirely different toolbox of knowledge and skills making a revolutionary contribution to science in an area that was not his.

A contemporary of Mendel was the French scientist Louis Pasteur. Born the same year of Mendel, Pasteur was trained as a chemist. When he proposed the idea that diseases were

generated by microorganisms that we could hardly see under the microscope, he was ridiculed by his colleagues who shouted at the places where he was lecturing, "Shut the doors. Pasteur's creatures may come in."

Another similar example of "left field" ideas is that of plate tectonics. Alfred Wegener, a German born in 1880, was a trained meteorologist who could not avoid, while looking at a world map, seeing that the continents fit together like pieces of a jigsaw puzzle. Using meteorological data, he proposed in 1912 the idea that all the continents were originally joined and had broken up in pieces generating the shapes of today's landmasses. His idea was ridiculed by most fellow scientists of his time.

It took more than half a century for this theory to be recognized as true, thus generating the most important revolution in geological sciences in the 20th century.

You might consider these examples a thing of the past because science is much more rational and serious today, but you would be mistaken.

Stomach ulcers is a medical condition known since ancient times, and conventional wisdom dictated that they were caused by some foods or stress. Yet, in 1982, two Australian scientists, Robin Warren and Barry Marshall, proposed that most gastric ulcers and gastritis were caused by colonization of the bacterium *Helicobacter pylori*, a bacterium so common that 85 percent of people with it do not show any disease symptoms.

When Warren and Marshall proposed *H. pylori* as the cause of most

gastric ulcers, they were laughed at. Yet they were so convinced of their own hypothesis that Marshall drank a Petri dish with a culture of the bacterium extracted from the stomach of a person with an ulcer and five days later he developed gastritis. At the urging of his wife he took some antibiotics and was completely cured. The results of this experiment were published in 1984.

Thanks to this self-experimentation, today we know that ulcer infection is curable. In 2005 Marshall and Warren received the Nobel Prize in physiology and medicine "for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease."

Given the numerous challenges that higher education is facing today we need real breakthroughs that help us to solve issues such as financing, demographics, bad publicity, and bad management, that are facing academia. If the examples mentioned above teach us anything it is that big problems are solved via quantum leaps toward the future, breaks with the past and challenging conventional wisdom.

To that end, we need not only courage and imagination, but also not being afraid of failure. Fear leads us to retrenchment and that is what we are seeing a lot these days. We cannot pretend to solve the problems that affect us today with the same failed solutions of the past.

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One common expression in the English language, particularly on this side of the Atlantic, is to refer to unexpected or crazy ideas as coming "out of left field." The expression originated from baseball, specifically after Wrigley Field, home of the Chicago Cubs, was built in 1914. In what is today the left field of the stadium, there used to be what was then called a mental asylum. So when something crazy or unforeseen happened it was said to be "out of the left field."

Some of the greatest ideas in the history of civilization came "out of the left field." Not only were they truly revolutionary, but when initially proposed were considered crazy and simply ignored. Many of these ideas originated in academia, known for its conservatism and rigidity when dealing with people who defy conventional wisdom. Examples abound.

The science of heredity, known as genetics, is a fundamental tool in medical science. It helps us to understand not only the issue of hereditary diseases, but also the increasing resistance to antibiotics created by their widespread use by the general public. Genetics also helps us to create more efficient crops, and helps us develop immunity to many diseases.

The origins of that science began with Gregor Mendel. Born in 1822 in what is today the Czech Republic, Mendel entered the Augustinian order because his family was too poor for him to afford an education. The only free education offered at the time was from the different religious orders. Because the Augustinians supplied teachers to the Austrian schools, he was sent to the University of Vienna