

What makes a genius?

Out of the Box

Tony Chan Fan-cheong is president of the Hong Kong University of Science and Technology. He has spent his life pursuing his dreams relating to teaching and research, and has unique views on education, scientific and technological development, and nurturing the young.



THE US MAGAZINE *National Geographic* recently published an article titled *What makes a genius?*, in collaboration with its latest TV series, *Genius*, which explores the life of Albert Einstein – the unanimous choice of what “genius” means.

I read the article with much interest, and found in it a person on the list of geniuses whom I have known personally for years: Terence Tao.

Tao is the only ethnic Chinese mentioned in the list, among other historical greats such as da Vinci, Michelangelo, Newton, Shakespeare and Darwin.

Tao's parents are first-generation Hong Kong immigrants in Australia. Both of his parents graduated from the University of Hong Kong.

Tao has been crowned a “genius” since he was a kid; he entered high school at seven, became a gold medalist at the International mathematical Olympiad at 13, received his PhD from Princeton at 21, and

became a professor at the University of California, Los Angeles, at 24.

Tao was my departmental colleague at UCLA for over a decade, and I was involved in recruiting him when I was department vice chair. I was at the International Congress of Mathematicians in 2006 to witness him winning the Fields Medal at only 31.

Often described as the “Mozart of math”, he is widely regarded as one of the brightest minds working in the field today. Over history many have tried to answer the question posted in the title of the article but the truth remains elusive. I have known a few geniuses myself and everyone has his own theory but I learned quite a few insights after reading this article.

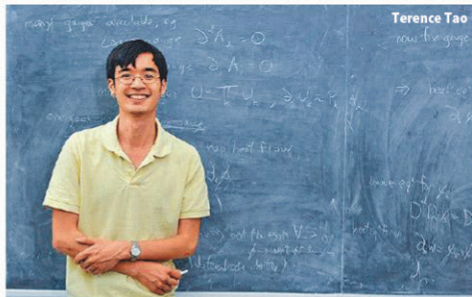
First, there is not a single source of genius. There are many factors and traits involved, but high intelligence alone is not sufficient.

Lewis Terman, who invented the IQ test, found that many high IQ people do not achieve success in their careers, whereas those who barely missed his cut (still very intelligent) often turned out to make a major impact in their careers – for example Nobel laureate William Shockley, who invented the transistor.

Charles Darwin was not a super student either.

Brain scan studies have shown that geniuses often have better connection between their left and right brains, indicating that the ability to think across traditional boundaries could be a key trait of geniuses.

Another fact is that most geniuses don't come from



Terence Tao

genius parents. That may seem surprising but there are very few genius parent-child pairs in history.

Many have tried to identify a “genius gene,” but so far without success.

On the other hand, a nurturing environment is very important. Tao's parents are credited with providing a great nurturing environment for him when he was growing up, and introducing him to other experts in nurturing talented students.

External environment is just as important, such as from Baghdad in early times to Silicon Valley today.

Even with all the scientific advances today, we cannot explain how geniuses think. We do know that the “aha!” moments of discoveries often come

in the most unexpected time. The *National Geographic* article says: “Information comes in consciously but the problem is processed unconsciously, with the resulting solution leaping out when the mind least expects it.”

And there is always fate and luck; it helps to be at the right place at the right time and equipped with high intelligence and other genius traits.

What does this mean for Hongkongers? We read often about how over the top young parents can be in this city, but

perhaps we should all just be a bit more relaxed and less rigid about our kids' education.

It would be good to recognize the importance of providing a good environment in addition to force-feeding information to our children.

Developing non-academic interests should be seen as providing the brain with more lateral and connective thinking, rather than merely as padding the records for getting into good schools. After all, even being intelligent and having the right parental and academic pedigree does not guarantee success in career or life. Alas, our children will have to look after themselves and chart their own course later in life.