24 October 2012
HUFFPOST TECH UNITED KINGDOM

Criticisms and Defences of Science and Technology Prizes

Posted: 22/10/2012 17:46

Technology Academy Finland were delighted this month that the Nobel committee chose to award the Nobel Prize for medicine to Dr Shinya Yamanaka, who earlier this year also won the Millennium Technology Prize - which is run by Technology Academy Finland - for his revolutionary work on stem cells.

However, the week in which the Nobel Prize laureates are announced was, somewhat predictably, preceded by criticisms of the prize awarding process. An editorial in Scientific American argued that the Nobel awards process needs to change in order to recognise that increasingly major scientific advances are brought about by large teams and that selecting three members of the team to win the prize may be unfair. Other commentators have followed suit, raising awareness of the issue of team members being overlooked.

This and many other criticisms routinely leveled at science prizes are not specific to the Nobel Prizes. They are inherent in any award process but nevertheless need to be thoroughly and regularly addressed by any award worth its salt. No prize can be immune from healthy questioning.

Critics of prizes are right when they say that prize awarding is not a matter of mathematical precision, even when the prize in question is for science and technology. Subjective judgements unavoidably come into play. Major international prizes will from time to time find themselves accused of bias, whether ethical, cultural, geographical or gender-based.

It can be argued that the choice of a winner for an international science prize, whose nominees can be drawn from a wide range of disciplines, is necessarily as subjective as the choice of any book or painting to win an arts prize. One can never entirely be comparing like with like, unless the field examined is extremely narrow.

Just because no prize giving process can be beyond debate does not mean that prize committees should not and do not strive for objectivity. Any reputable selection committee should demonstrably make every conceivable effort to guard itself against accusations of bias. A robust vetting and judging process involving a panel of eminent scientists from academia and industry who carry out thorough research into the work of the candidates is a core minimum, and certainly something that Technology Academy Finland (TAF) takes extremely seriously when awarding the Millennium Technology Prize. The scientific and technological community needs to be onboard and to have faith that the prize is run by experts in the field. TAF also believe that it is crucial for a science prize to apply clear criteria that are understood by everybody in the global scientific community.

Ultimately a prize will only gain credibility amongst the scientific community over time, as it develops a track record of picking scientists who go on to be widely followed and regarded. The selection criteria of the Millennium Technology Prize is to award the prize to innovators whose inventions have practical implications, and where the resulting technological breakthrough has already started to enhance people's quality of life and was worthy of long term development.

The Millennium Technology Prize has focused on making awards to those who have developed technologies in practice, not on those who have pushed the boundaries on a theoretical scientific problem, however important that might be. An additional safeguard that the specific criteria for the Millennium Technology Prize are adhered to is the fact that one of the criteria in awarding the prize is that the innovator will continue its development him or herself

This year, for the first time in the Millennium Technology Prize's ten-year history, applying these criteria with great rigour did not enable the international selection committee to select one Grand Prize winner from the two laureate nominees. In June, the award was split for the first time between open source computer programmer Linus Torvalds and cell stem researcher Dr Shinya Yamanka, who also went on to jointly win the Nobel Prize for medicine last week.

The committee debated for a long time, trying to find a way in which one laureate would rise above the other following our criteria. We revisited the criteria, taking a variety of approaches to their application. It was a very interesting process; never before has anything like this happened. In part this was simply because the two fields of innovation under question - computer programming and biotechnology - were too different from each other to be usefully compared.

When running a major international science prize ranging over a variety of disciplines, this is an issue that is always present and will occasionally come up strongly. How do we compare the advantages of freedom for programmers, who will come up with untold improvements to our day-to-day lives, with the medical, life-enhancing possibilities of stem-cell research?

It can be difficult to predict the impact that a recent scientific advance will have on humanity, as we can't know the use to which humanity will put it, nor predict all the commercial influences that will affect this. For example, Dr Yamanaka's research anticipates that many life-threatening diseases will ultimately be conquered through his invention of induced pluripotent stem cells. But we cannot say with certainly whether or not this will be achieved. Awarding a prize on the basis of an innovation's benefit to humanity involves a certain amount of sooth-saying, and we were delighted to have successfully led the way in recognising Dr Yamanaka, prior to his Nobel Prize.

The Nobel Prize Committee has traditionally focused on rewarding lifetime achievement. Now they are also recognising scientists who are creating and developing the innovations of the future. We have taken this approach in running Finland's Millennium Technology Prize, which focuses on innovations of the future with a strong scientific track record combined with a foreseeable applications pipeline. Professor Yamanaka's innovation has solved many of the ethical questions connected with stem cell research, which has scaled up research activity and hugely increased the development of new therapies globally".

The winners of the Millennium Technology Prize have already demonstrated that they can improve the lot of humanity in the

present and in the foreseeable future. The winner of the first Millennium Technology Prize was Tim Berners-Lee, the inventor of the World Wide Web. While Dr Yamanaka was not a well-known name outside scientific circles, before winning the Millennium Technology Prize, the prize committee thought there was a reasonable chance that his work would come to be very highly regarded in the future. Joint 2012 winner Linus Torvalds however, was already well known to the general public.

Hopefully we've got the balance right between big names and less well-known scientists, though the degree to which a scientist is famous is irrelevant to the judging criteria of the Millennium Technology Prize. Critics of science prizes sometimes argue that prize committees are swayed by rivalries and jealousies that have little to do with scientific merit or technological impact, and that 'big name' obvious winners are selected for PR reasons, to advance recognition of the prize itself. We would hope that the Millennium Technology Prize has been able to avoid this failing.

Once due care has been taken in setting clear criteria and highly rigorous judging processes, a prize awarding body can only focus on the benefits that science prizes bring. In addition to the help to the careers of individual scientists, prizes also have a value in promoting widely the role that scientists and engineeers play in society. This can be particularly important in a country like the UK where a lack of science literate politicians, let alone practicing scientist politicians, has often be criticized since chemist Margaret Thatcher left office, and where recent research by the Institute of Physics has revealed that half of state schools do not have any girls studying A Level physics.

TAF believes that the environmental and health challenges that the world faces are daunting, and only technological innovations of the kind celebrated by the Millennium Technology Prize can tackle them. Scientists are often not as celebrated as other cultural figures, and prizes provide a chance to focus on their achievements, and for the public generally to become more literate about science as the media covers their particular invention.

There is therefore a high value in the publicity attendant on a prize that sparks scientific debates, raises the profile of science at a domestic level, and creates a sense of excitement around technology. When a scientist from a particular country wins a prize, this draws attention to a country's domestic scientific goals, and this can have a powerful impact internally. It is helpful for countries to benchmark themselves against others to prompt an internal debate about how a country is performing in high-tech sectors. Prizes create a healthy awareness of the international competition, even if sometimes the competition is sore at the chosen winner.

Follow Dr Ainomaija Haarla on Twitter: www.twitter.com/Tech_Acad_Fin