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OPINION



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ENDLESS PERSEVERANCE

NEVER STOP LEARNING

The pursuit of knowledge is lifelong and has no age barrier

THE power of knowledge was underlined last week when the Nobel Prize in Chemistry was awarded to John Goodenough, Stanley Whittingham and Akira Yoshino for their work in developing lithium-ion batteries.

In the words of the Nobel Prize Committee, the trio “created a rechargeable world”.

While rechargeable batteries were around in the 1970s, they had drawbacks, including the amount of energy they could store.

Lithium, it turned out, offered an answer since it is a very light metal and chemically well suited for use in batteries.

However, lithium’s reactivity made it tricky to harness.

The lightweight, rechargeable and powerful lithium-ion battery is now used universally in everything from electric vehicles to mobile phones and laptops, the everyday things that we use to communicate, work, study, listen to music and so much more.

And it can store significant amounts of energy from solar and wind power, bringing us a step closer to a fossil fuel-free society.

As they say: “Necessity is the mother of invention,” and, according to the Nobel announcement from the Royal Swedish Academy of Sciences, the origins of the lithium-ion battery can be traced to the oil crisis of the 1970s.

It inspired Whittingham, now 78, a United Kingdom-born scientist working in the United States, to pursue fossil fuel-free energy technologies. He started to research superconductors and discovered an extremely energy-rich material, which he used to create an innovative cathode in a lithium battery.

This was made from titanium disulphide which, at a molecular level, has spaces that can house lithium ions. The battery’s anode was partially made from metallic lithium, which has a strong drive to release electrons.

This resulted in a battery that literally had great potential, just



Tun Daim Zainuddin and Dr Nik Serena Nik Zainal (inset) set the bar very high but they demonstrated how each of us at every age can pursue knowledge and contribute to society in our own way. FILE PIX

over two volts.

However, metallic lithium is reactive and the battery was too explosive to be viable.

American Goodenough — now 97 and the oldest person ever awarded a Nobel Prize in any field — predicted that the cathode would have even greater potential if it was made using a metal oxide instead of a metal sulphide.

In 1980 he demonstrated that his idea can produce as much as four volts.

This was an important breakthrough and would lead to much more powerful batteries.

With Goodenough’s cathode as a basis, Yoshino, the youngest of the distinguished laureates at 71, created the first commercially viable lithium-ion battery in 1985, a lightweight, long-lasting battery that could be charged hundreds of times before performance deteriorated.

“Lithium-ion batteries have revolutionised our lives since

they first entered the market in 1991,” said the Nobel Prize Committee.

“They have laid the foundation of a wireless, fossil fuel-free society and are of the greatest benefit to humankind.”

The achievements of these three Nobel winners illustrate the relevancy of research and development, as well as the power of scientific networking and collaboration among researchers of different nationalities.

They also inspire us in other ways: all three continue to work and contribute well into their elder years.

Even at 97, Prof Goodenough still works in a lab at the University of Texas every day.

At 78, Prof Whittingham continues to teach Chemistry and is director of both the Institute for Materials Research and the Materials Science and Engineering programme at Binghamton University, part of the State Univer-

sity of New York.

And Prof Yoshino is a fellow of Asahi Kasei Corporation and a professor at Meijo University in Nagoya.

Indeed, all three laureates personify the idea that the pursuit of knowledge is lifelong; it has no age barrier.

Here at home, so too does Tun Daim Zainuddin, the former finance minister and former Council of Eminent Persons (CEP) chairman, who obtained his Doctor of Philosophy (PhD) degree last weekend from Universiti Malaya at age 81, after 11 years of work on his thesis.

His failing health and other urgent national duties were part of the reasons for the delay.

Chancellor Sultan of Perak Sultan Nazrin Muizzuddin Shah presided over the presentation of degrees during the first session of the university’s 59th convocation at Dewan Tunku Canselor.

We all extend our congratulations to Daim, who counselled that people should continue to seek knowledge for as long as they live and that “only through knowledge we can achieve success”.

Furthermore, “knowledge must be put to good use. It should not be used for negative things”.

Malaysians last week were also awakened by the wonderful news that Dr Nik Serena Nik Zainal, at-



tached to the University of Cambridge’s Department of Medical Genetics, has been chosen as the recipient of the Dr Josef Steiner Cancer Research Prize 2019.

The award, commonly dubbed the “Nobel prize in cancer research”, is being presented to her for her work on cancer genome interpretation.

Her research work allows for mutations in cancer tumours to be analysed using new bio-informatics methods, which in turn enables new approaches to targeted therapies.

All these people set the bar very high but demonstrate how each of us at every age can pursue knowledge and contribute to society in our own way.

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