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MR WOZNIAK'S advice
to aspiring whizz-kids

Wozniak's 'open door' innovation



Irene Tham

Keep the doors of your storeroom open, for therein lies the key to innovation.

"Just in case engineers want to come in at night to build things," says Apple co-founder Steve Wozniak, 60.

The lesser-known Steve of Apple was highlighting the need for companies to give employees free time and resources to explore their pet projects, for they may stumble on the next big thing.

Steve Jobs is, of course, the better-known co-founder.

Mr Wozniak was in Singapore to speak at the inaugural Driving Innovation Excellence (Drive) motivational talk series jointly organised by the Singapore Workforce Development Agency (WDA) and NTUC LearningHub.

Currently the chief scientist of data storage firm Fusion-IO, he shared his thoughts on innovation and creativity with about 200 professionals at the National Trades Union Congress building two Tuesdays ago.

The man who helped shape the personal computing world has one piece of advice for aspiring whizz-kids. "Believe in yourself even when people are telling you that your ideas aren't going to make it," he said.

Growing up in Los Gatos, California, he was inspired by his Lockheed Martin engineer father, who taught him everything about electronics and mathematics when he was in elementary school. That sparked his interest in science and technology. He also drew inspiration from the Tom Swift series of science fiction and adventure novels.

By the time he was in his early teens, he had some serious achievements under his belt. He acquired his amateur radio (ham radio) licence and created his own computer that played tic-tac-toe. He also built a transistor-powered calculator for a science fair that won the first prize.

He was self-taught, he said, zeroing in on the point that learning and innovation happen mostly outside the classroom.

"It is more important to motivate students to learn than to teach them things," he said.

One of the ways is to give students fun problems to solve. Then they will be motivated to read up to find answers to the problem, he said, highlighting how intrinsic motivation drives individuals to create new things.

He related this principle to his personal desire to own a computer, even though one cost as much as a house – or around US\$10,000 – in the 1970s.

That desire would later lead to the creation of the first ready-to-use personal computer, called the Apple I.

The engineering talent for the Apple I came from Mr Wozniak, while Mr Jobs added ingenuity and marketing smarts.

The duo first met at Hewlett-Packard in 1971 when Mr Wozniak was 21 and Mr Jobs, 16.

They met regularly with a group of electronics enthusiasts in Stanford Linear Accelerator Centre – re-

named SLAC National Accelerator Laboratory – in Palo Alto, where they would share information on the Altair 8000.

The Altair 8000 was every geek's dream computer at that time. But the two Steves did not have enough money to buy it. A ready-to-use version cost more than US\$600. But the desire to own one drove them to build their own.

He sold his Hewlett-Packard scientific calculator and Mr Jobs sold his Volkswagen van. They raised US\$1,300 for assembling the first prototypes.

Starved of resources, they were also forced to come up with a design that could save on components. This gelled with Mr Wozniak's mantra to always design with the fewest parts.

When a US\$50,000 order came in for 100 units of their invention, they needed more money – about US\$20,000 to buy parts.

Mr Jobs went to a local parts supplier and convinced the boss into giving the parts on 30 days' net credit. The pressure was on to build and sell the machines before the credit was up.

"That was how we made the Apple I. We built and sold them in 10 days for cash," said Mr Wozniak.

That year in 1976, they founded Apple Computer in a garage in Silicon Valley. And the rest is history.

Mr Wozniak left Apple in 1985 – although he said he never quite left as he still gets US\$200 every two weeks from Apple – to start remote control switch and wireless global positioning systems companies. He later abandoned the former, and shut down the latter.

He also taught computer lessons to 10-year-olds in his hometown.

But the inventor never stopped dreaming. He envisions a day when a computer will run completely on photons instead of electrons, making them more energy-efficient and faster. He also believes that the maker of iMac computers, iPod music players and iPhones has room for more innovation.

"There's every kind of electrical appliance in our lives that Apple doesn't already make that it sure can make."