



Mr Joseph Oh is among people with disabilities who have benefited from assistive technology. He once suffered a lack of self-esteem due to a speech disorder, but through using a specialised text-to-speech app while in polytechnic, he became better able to express himself and his confidence grew. ST PHOTO KEVIN CHING

Taking special needs technology mainstream

Targeted software in consumer devices, better accessibility features a boon for those with disabilities

Kenny Chee
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When he was just seven years old, Mr Joseph Oh suffered a viral infection that caused inflammation in his brain. He recovered after a few months, but developed a motor speech disorder that makes him slur his words.

It was difficult for others to understand him, and the self-described introvert became even more reticent and reluctant to interact with others. His self-esteem and confidence plummeted.

School was difficult. His teachers would ignore him when he asked questions. "I felt very left out for years," said Mr Oh, now 25, using handwritten notes during a recent interview.

His teachers liked him little exposure to people with disabilities at the time, he said.

But technology helped turn things around for him.

After enrolling in Republic Polytechnic in 2008 to study marine science and aquaculture, he was referred by a school counsellor who specialised in special education needs to the Specialised Assistive Technology Centre under disability charity SPD.

There, Mr Oh learnt how to use a specialised text-to-speech app, which allowed him to customise its speaking voice by changing its speed or pitch.

"Through using it during presentations in class, he became better able to express himself and his confidence grew," he said.

Opportunities opened up as well. His polytechnic lecturers allowed him to do his final year project at Nanyang Technological University.

And now he is employed as a laboratory technician at Temasek Life Sciences Laboratory.

Advances in such assistive technology over the years have helped many people with disabilities, including Mr Oh.

cluding Mr Oh, meet day to day challenges, with software now available on more mainstream consumer electronic devices.

The app that Mr Oh uses is available for Apple's iPad tablets.

Tech giants Apple, Google and Microsoft have in recent months also improved accessibility features in their products. These include letting people use facial gestures to navigate their phones, and enhancements to speech-to-text functions.

SPD chief executive Abhimanyu Pal said: "This has largely made it possible for persons with disabilities to enjoy using software and devices that are widely used by the general population."

It also means more people with disabilities are no longer limited to niche and expensive devices - such as dedicated ones that help people communicate, which previously could cost up to several thousands of dollars, he said.

This is as there are now communication apps that can perform similar functions for mainstream electronic devices, and they cost less - up to \$400 for some apps.

The advent and proliferation of smart home devices has also been a boon.

"This can go a long way towards enabling persons with disabilities to live more independently," said Mr Alvin Tan, head of technology catalyst at SG Enable, an agency that provides services for people with disabilities.

Devices such as smart speakers have enabled those with visual and physical disabilities to control household functions - such as the air conditioner or the lights - by voice.

Assistive technology has also benefited students with special needs in their learning journey.

At the Rainbow Centre, which provides educational services for children with multiple disabilities, said eye trackers have enabled its students to use their eyes to make selections on apps, allowing them to participate in lessons and communicate with others.

Special switches also help them to easily carry out actions on devices such as tablets.

Even as the Covid-19 pandemic has made it difficult for students with special needs to be taken outside to be taught how to travel in public, apps and online resources have allowed educators to still go over lessons with them.

Google Maps, for instance, has been used to help them learn how to get from place to place.

Ms Siti Farhani Jumahat, a lead teacher at Yishun Park School under the Rainbow Centre, said: "As the education landscape changes, it is necessary to continually adapt to make learning accessible to students with different needs, to support them in building good lives where they can be connected, included, independent and heard."

Meanwhile, more people are tapping the Assistive Technology Fund for government subsidies to buy or repair assistive devices.

From April 2019 to March last year, SG Enable administered more than 3,000 fund applications, up from 1,900 between April 2015 and March 2016.

Mr Tan said this was due to more awareness of assistive technology devices and the scheme, as well as the fund's eligibility criteria being eased.

And the Tech Able assistive technology space, which opened in 2015 and is managed by SG Enable and SPD at the Enabling Village, has supported more than 1,300 people with disabilities.

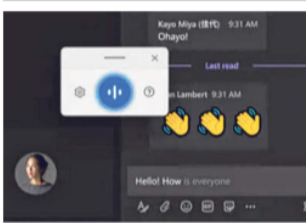
While technology can help, it can go only so far.

"What's more important is when open people are in accepting people with disabilities," said Mr Oh.

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• To find out more on assistive technology, visit techable.enablingvillage.sg

TECH HELP



The latest Windows version has upgrades to accessibility features from the previous version of the operating system. PHOTO: MICROSOFT

Windows 11 speech-to-text feature comes with auto-punctuation

Microsoft's new Windows 11 released last month comes with upgrades to accessibility features from the previous version of the computer operating system.

Voice Typing, which converts spoken words into text, now adds an option to automatically punctuate the dictated speech.

While Windows 10 already has a dark mode, Windows 11 adds more

customisable dark backgrounds of varying intensities with light-coloured text. Dubbed contrast themes, they make the screen easier to view for people who are sensitive to light.

Windows 11 has also brought back the start-up sound which helps signal to users with visual disabilities that the computer is on.

iOS 15 can describe images verbally; Mandarin added to Voice Control

Released in September, Apple's iOS 15 includes a number of updates to accessibility options for iPhone users.

People with low vision can benefit from VoiceOver, which figures out what is in an image and describes it to them.

For example, when the user taps on people or objects in a photo, the function verbally describes them. It can also read out pictured text even if this is not annotated.

Mandarin and Cantonese are now recognised by Voice Control, which allows users with physical disabilities to use these languages to control the functions of their phones.

Another iOS 15 addition allows people to use simple vocalised

sounds to navigate their devices and carry out actions through the Switch Control feature.

So a person could click his tongue to select an item on the screen, make a "ts" sound to move to the next item and make a "ts" sound to go back to the phone's home screen.

iPhone users can now customise the text size and display options, including inverting the colours, for different apps, allowing more choices for people with colour-blindness or low vision.

The Magnifier app, which turns the iPhone into a magnifying glass to zoom in on things like printed text and images on a screen, is now on the device's home screen by default in iOS 15.



The Prodigy Connect 12 makes text look several times bigger on its tablet-like screen. It can also read out the magnified text. ST PHOTO ALPHONSEUS CHEIN

Magnifying text near and far, and reading it out if required

There are products that can help people with low vision by magnifying reading material and even reading out what has been magnified.

The Prodigy Connect 12 makes text look several times bigger on its tablet-like screen.

If notes are scribbled on the book being read, they will be magnified by the device - through looking it up to a camera.

The device can also read out the magnified text with the press of a button.

Text displayed far away, such as on a blackboard, can also be magnified by the device - through looking it up to a camera.

Senior Tech Correspondent Kenny Chee finds out what assistive tech software and hardware are available for people with disabilities in Singapore.

A TAP OR LOOK AWAY



EyeGate Edge has a camera that monitors the user's eye movements to determine where he is looking on the screen. ST PHOTO ALPHONSEUS CHEIN

Tracking eye movements to help user get words typed out

For people with disabilities that make it difficult for them to physically type out words, there are eye-tracking products that can help.

An example is EyeGate Edge, a device that has a camera to monitor the user's eye movements to determine where he is looking on the screen.

If his gaze stays on a letter long enough, it will be typed out.

The user can also activate commands such as for reading out what he has typed, allowing him to communicate with others.

The set-up can be customised for navigating computers as well.



The Roger Pen microphone amplifies audio and sends it to the user's hearing aid. In the background is the Roger MyLink receiver. ST PHOTO ALPHONSEUS CHEIN

Wireless microphone transmits amplified sounds to hearing aids

Products such as the Roger Pen wireless microphone can help people who rely on hearing aids hear better.

The Roger Pen, which looks like a discrete pen, can do this by reducing background noise and boosting audio near its user, such as from where the device is being pointed.

The device can send the amplified sound signals to a person's Bluetooth-enabled listening aid.

People with old hearing aids that use T-coils will need the Roger MyLink receiver to send the Roger Pen's audio signals to the aids.

The Roger Pen can also be connected to a smartphone so that audio from incoming calls is sent to the user's hearing aid.

Navigating Android phones through facial gestures like raising an eyebrow

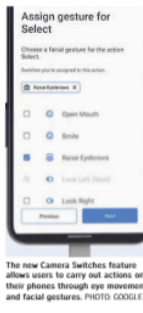
Google in September released new accessibility options for smartphones that use the search giant's Android mobile operating system.

With the new Camera Switches feature in Android, a person can use eye movements and facial gestures - such as looking to the right, raising an eyebrow or opening his mouth - to carry out actions on the phone.

The feature uses the phone's camera to recognise specific gestures mapped to actions like making a selection on the screen or scrolling up.

A new Android app, Project ActiVise by Google, is another extension of Camera Switches.

This app allows a person to use facial gestures to quickly activate customised actions, such as speaking a



The new Camera Switches feature allows users to carry out actions on their phones through eye movements and facial gestures. PHOTO: GOOGLE

Smart cane to detect obstacles

While walking can be help people with visual disabilities detect some obstacles in front of them, they are not very helpful when it comes to obstructions at the height of the person's chest or higher.

Smart canes like the one from WeWalk can overcome this. WeWalk uses an ultrasonic sensor to detect such obstructions and alerts the user by vibrating.

An alternative to this is the Senui Island smartwatch, which has a sensor that also uses sonar to detect objects in front of the user above the waist. But in this case, a visually impaired person still needs to rely on a cane or guide dog to detect obstacles below the waist.

The WeWalk smart cane can be paired with a smartphone app to save favourite locations and guide the user to the destination turn by turn.

SG Enable's head of technology catalyst Alvin Tan with WeWalk, which uses an ultrasonic sensor. ST PHOTO ALPHONSEUS CHEIN



Adaptive switches that are actuated by being (from left) tapped on, pressed and squeezed. ST PHOTO ALPHONSEUS CHEIN

Special switches for clicking mouse buttons or pressing keyboard keys

It can be challenging for people with certain physical disabilities or motor function issues to type on a computer keyboard or click the mouse.

To help them use these devices, different adaptive switches have been made to cater to different needs.

These switches can be connected to a switch interface that is plugged into a computer. Each switch can be configured to correspond to an action, such as pressing the enter key on a keyboard or clicking the right mouse button.

Examples of adaptive switches include those that can be activated with a light tap, large button switches that can be pressed with our precise movement, and those that work by being squeezed.