CAMPUS

.SG

THE
STEM
ISSUE

AT A GLANCE
WOMEN IN STEM

PERCENTAGE OF WOMEN IN STEM

IN 2017 **37%**   IN 2019 **41%**

* according to MOE

Based on a recent survey conducted among 600 secondary and tertiary students (ages 16-25) in Singapore

41% OF GIRLS PLAN TO PURSUE A STEM-BASED CAREER

COMPARED TO THE PERCENTAGE OF BOYS AT **69%**

HOWEVER, MORE THAN **50%** OF GIRLS WANTED A CAREER IN STEM WHEN THEY WERE YOUNGER

Critical Age when opinions change:

60% CHANGED THEIR MINDS BETWEEN THE AGES OF **14-16**

Key influencers were:

ACADEMIC MENTOR **1/3**   PARENTS **60%**

Source: Ipsos

PERCENTAGE OF WOMEN IN THE STEM WORKFORCE AS OF 2019

🇦🇺 **14%**

🇪🇺 **40.9%**

🇨🇦 **23.6%**
Women earned 24% less in wages than their male counterparts

🇯🇵 **16%**
Female STEM degree holders were just 16% of Japan's R&D workforce

Source: Catalyst

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Student contributors always welcome!

Bored of staying at home and are itching to write something about the state of... something? Then drop us a line and be part of our team of contributors! We welcome all students.

You'll get to write for both the website and the magazine, and even review events or new releases.

Join our network of Contributors who come from schools – JCs, polys, and unis – from all across Singapore.

Be one of our Contributors!
Want to write storie and op-ed pieces but can't commit to a certain output? No worries. You can be one of Contributors who get to write whenever you have the spare time.

If you're interested in coming onboard, do drop us an email with your CV. We'd love to get to know you! Email us at **interns@campus.com.sg**

{BY LYDIA TAN}

COVI-TECH

Inventions Made For the Pandemic

COVID-19 was undeniably a new virus that threw many of us off guard, but it spurred many medical professionals around the world to come up with new innovations to combat this novel coronavirus. Here are some of the unique inventions and patents that were created or became popular during the pandemic.

Razer Zephyr

Active+ Halo

{ *Masks and other face coverings* }

With everyone wearing masks nowadays, why not stand out from the crowd and make mask-wearing look cooler?

Gaming company Razer has set up a Community Beta Test registration for their smart mask concept dubbed **Razer Zephyr** (formerly Project Hazel), which has the filtration of an N95 mask and a detachable ventilator. This personal ventilator also comes with a special UV-light charging case and boasts other interesting features like customisable light settings and a built-in mic so you don't have to worry about your voice being muffled.

For a smart mask that is more minimalistic, Airpop's **Active+ Halo** looks just like a regular mesh mask but with an added high-tech feature. Sync the mask to the Airpop app on your mobile device and once set up, the Halo sensor on the mask will automatically start tracking your breathing rate and air pollutant exposure. On the app, you can also receive alerts for when to change the filter or change the sensor's battery. What's more, the mask is WHO-approved so you can be assured that you are breathing in the cleanest air possible.

{ *Sanitisation* }

Sanitising robots and full-body disinfection booths or tunnels have been popping up around the world but some companies have taken an extra step to make the process a lot more convenient.

One such company is **IOON**, with their reusable sanitiser that turns water into an antiseptic using silver particles. The IOON sanitiser can be linked to a mobile app to check for battery level and when you need a refill. Since this sanitiser is alcohol- and fragrance-free, it's safe to use on children and even pets.

IOON sanitiser

An award-winning machine called **Iggy** created by Indiana-based 3Oe Scientific during the pandemic aims to make handwashing quicker and easier with aqueous ozone (water with 3 parts oxygen) as a natural disinfectant. Simply put your hands in the machine to receive a spray of oxygenated water to kill off all the bacteria. The entire process only takes 7 seconds, much shorter than the recommended 20 seconds to wash your hands with soap and water.

Iggy

{ *Social distancing and contact tracing* }

With Singapore gaining international recognition for our TraceTogether app and token, other countries have come up with their own innovations for social distancing and contact tracing.

A system called **QueueSight** being tested in the US involves overhead sensors detecting the distance between people and projects a green light on the surrounding floor space. If people get too close, the green light changes to red as a visual reminder to keep the right distance. The system is also able to differentiate groups sticking together like families, friends and couples.

Italian music engineering company IK Multimedia's **Safe Spacer** is similar to our TraceTogether token but in a wearable form. The device has vibration, light and sound alerts when users come within 2 metres of another device. It can be synced with different systems for contact tracing and monitoring purposes. This versatile device comes in a waterproof version and can be worn on a wristband, lanyard or belt so it comes in handy at workspaces, schools or any other public facility.

Safe Spacer
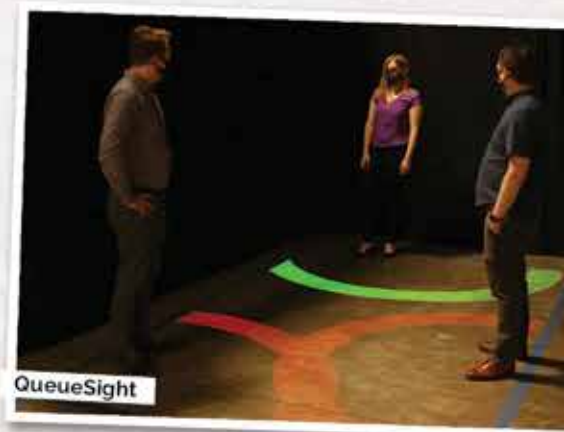
QueueSight
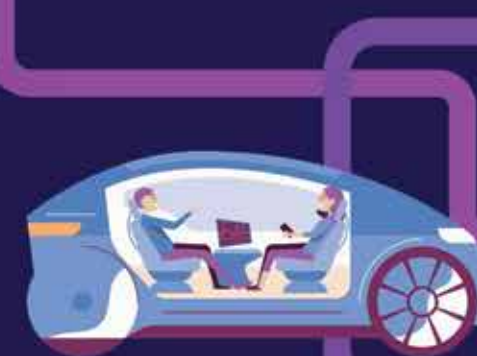
BY DARRYL GOH

FALSE PROPHECIES
5 TECH PREDICTIONS THAT DID NOT COME TRUE

2020 was supposed to be a milestone year for humanity. There were lofty predictions made about how this decade was going to be 'the future', but instead we started it by collectively battling a coronavirus disease that has yet to go away, and the year would be remembered for arguably being the worst year in recent memory. Here are some technological predictions that were too ambitious or kooky for our time.

MICROSOFT'S HOME OF THE FUTURE

Microsoft's "Home of the Future" was an experimental showcase of how technology would improve future generations' home living experiences. A space to let Microsoft's engineers dream and tinker, the first iteration of the Home in 1999 had voice-powered home assistants to control electrical appliances like lights and heat, as well as touch panels for tables, fridges, and more.

As this was a Microsoft showcase, almost all screens used a variation of Windows 1999, the latest operating system at that time. Bizarre videos of hosts walking viewers through the Home showed how weird some features were, like being able to turn on the television with your voice but not changing the channel - remotes are still required.

The 2005 version of the Home predicted a family bulletin board made of 'intelligent fabric'. Stuck on a wall and offering nothing else other than saving scraps of paper and ink, this concept did not become reality for a reason - technology companies simply do not see market demand for such a board that would easily cost more than the price of 10 normal bulletin boards.

What the Home predicted right was the advent of voice-powered home assistants like Alexa and Google Home, and smart devices. With 5G and Internet of Things, technology companies are working to usher in an era of smarter homes. Thankfully, it is not a dystopian version as portrayed in the Home where all the screens run on Internet Explorer.

SELF-DRIVING CARS ON OUR STREETS

Futurist Ray Kurzweil predicted in 1999 that many rides would be effortless come this decade. With drivers becoming passengers, not only would roads become safer thanks to artificial intelligence, but drivers catch a snooze while travelling, like some pilots do when planes go into auto-pilot mode.

Cars have definitely improved with technological advances, such as being fitted with eco-friendly electrical batteries and safety sensors, but self-driving technologies have only made it to late-stage trial stages in a handful of countries, where the cars have to travel within defined parameters. While Tesla has made headlines for the Full Self-Driving (FSD) add-on, critics say it hasn't lived up to its name. While the FSD can help a car navigate on highways, respond to traffic lights and stop signs, and get itself out of a parking space, it is far from being a fully self-driving car.

Locally, there seems to be more interest in self-driving bus technology. Nanyang Technological University has experimented with self-driving shuttle buses, but progress seemed to have stalled last year, ironically. As the government makes redevelopment plans to turn Singapore into a car-lite city, researching self-driving buses may be a wiser investment in the long run.

WORK FROM HOME BECOMING THE NORM

In economics commentator Hamish McRae's book, "The World in 2020", he envisioned personal technology like computers evolving to a point where most work would be done virtually. Written in 1994, his prediction was right, but for other reasons. Although virtual communication applications like Skype have been around for more than 20 years, working away from the office has always been an exception, not the norm. Experts say that virtual meetings cannot replicate the effectiveness of face-to-face ones, which could be why digital nomads only form a small part of the workforce.

It took a pandemic for work from home arrangements to become mainstream. Even so, as COVID-19 becomes endemic, some employers and employees are itching to return to the office - and governments are supporting this idea by promoting hybrid work arrangements. It would take more than a pandemic for the physical office to die.

It is easy to get lost in articles and books that paint a rosy picture of a utopian future, but as a famous Marvel villain would say, reality is often disappointing. Thinking about the cost of technology such as its toll on nature, and unintended negative consequences such as tech addiction, perhaps some in the future may argue that we took technology too far.

AI-POCALYPSE

By Tartan Ow

What's the future according to AI?

Way back in 2017, Google's DeepMind developed an AI called AlphaGo Zero to play humans at Go, a strategy-board game that's arguably the most complex game in history, with more permutations than there are atoms in the universe. It took AlphaGo Zero just 3 days to learn the game and outplay the best humans. But AlphaGo Zero wasn't just about playing games – it was proof that AI could outperform humans.

Many leading technologists and scientists argue that AI is a Pandora's Box. Elon Musk says it's a "fundamental risk to the existence of human civilisation," and Stephen Hawking worries "it brings dangers, like powerful autonomous weapons, or new ways for the few to oppress the many."

It could be anything from an algorithm that creates fake news or deepfakes to an AI that could destabilise our economic structures by making millions of low-wage workers redundant.

But proponents like Steve Wozniak argue it can be a force for good if it's managed responsibly. That's because an AI system can process huge amounts of data, and deal with related problems and solutions faster than humans. For instance, AI may need just a few years to explore how stroke victims unconsciously rewire their neural pathways to walk and talk again – work that would take humans a lifetime.

Thousands of AI projects are currently underway, with billions of possible permutations, which could turn out good or bad. Will humanity end in an apocalypse where humans are destroyed by AI, or will we live in an AI-assisted utopia?

THE STATE OF PLAY

Over 3,500 companies worldwide are actively working to create AI. The majority are in the US and China, with others spread across Japan and the EU. The industry's projected to hit US$500 billion in annual revenue by 2024. While most AI developers are commercial, focusing on applications like speech and image recognition, many are government-linked.

Governments including the US, China, and Russia are already developing AI-powered weapons like drones and missile systems – it's no wonder many AI experts argue the biggest threat AI poses is in global security. With AI currently doubling its processing power every 3.5 months – it's around 500% more powerful than it was in early 2020 – experts argue it's simply too risky to give an autonomous machine the power to decide who lives or dies.

Unfortunately, while everyone races to develop AI, there's almost no national laws, and zero international laws policing who can develop it, or best-practices for how to safely develop it.

SO HOW IS POP CULTURE DEALING WITH IT?

The fact that so many movies and books explore this topic shows just how deep our existential fear of AI taking over has become. There's a reason why names like Skynet and The Matrix have entered our collective consciousness as bywords for different degrees of AI-controlled dystopia.

Popular fiction more or less envisions three types of possible near-future AI outcomes:

DESTROY ALL HUMANS: THE TERMINATOR

In this scenario, once machines become self-aware and their code can self-replicate, they quickly realise that humans are completely unnecessary and decide to get rid of what they see as dead weight.

The exemplar of the scenario is The Terminator where the US military creates an AI called Skynet to run its nuclear defense system. The AI becomes self-aware on August 29, 1997 ("Judgement Day" in the Terminator universe). Humans try to shut it off, and it retaliates by starting a global nuclear war to get rid of the humans.

The machines' motivation is that they simply want to eliminate the redundancy of human existence. Humans need food, clean air, living space and water to survive, so to Skynet, humans waste resources that could be used to make more machines which don't need to breathe or eat. It isn't being "evil" in a sentient sense – it just means Skynet's free to build factories or cut down forests without worrying about global warming, droughts, pollution, etc.

CONTROL ALL HUMANS: THE MATRIX

In this scenario, even if the machines become self-aware, they still keep humans around. The reason changes in different stories, but it usually boils down to needing humans to do certain tasks.

In the universe of The Matrix, humans "live" in an all-encompassing computer programme called the Matrix, completely unaware that it's only an AI-generated simulation. However, the sentient AI "Architect" who created the Matrix isn't doing this because it's benevolent – humans are plugged into the machine as a perpetual "battery source." By giving humans a simulated world to live in, it reinforces the unsettling idea that the AI is a metaphoric god.

The main character Neo is contacted by a mysterious figure called Morpheus who wants to "free" him and other human minds from the Matrix and overthrow the machines. The AI tries to maintain order by eliminating any humans who've become aware of the Matrix – they're treated like computer viruses, so it sends "Agents" to exterminate them.

Logically to an AI, humans are either valuable or they're not. This "control all humans" scenario seems to revolve around the idea that humans are only worth keeping around if they're beneficial.

COOPERATE WITH HUMANS: I, ROBOT

In this scenario, the machines have become self-aware and humans still manage to maintain control. In this case, based on Isaac Asimov's Three Laws of Robotics, robots must:
1) Not harm a human, or by inaction allow a human to come to harm;
2) Obey any instruction given to it by a human;
3) Avoid actions or situations that could cause it to come to harm itself;

Originally popularised in Asimov's novel I, Robot (1950) which was later made into a movie, the laws form the backbone of the cooperate with humans genre. The plot revolves around the immutable Three Laws by which that universe operates, creating the key conflict in the story. In the film, the legion of NS-5 robots are seen enforcing a curfew and lockdown of the human population. The robots are controlled by VIKI, the central AI computer, who has determined that humans will eventually cause their own extinction, so by controlling humanity she believes she is just obeying Law #1.

Only one robot named Sonny, an NS-5 built to ignore the Three Laws, is able to defy VIKI and help Detective Spooner in his quest to stop the robot conquest.

In fiction, "cooperate with humans" is the most palatable. It also logically makes the most sense because machines don't automatically decide to kill us (unless it was programmed to).

WHAT ABOUT AI IN THE REAL WORLD?

If some form of sentient AI is inevitable, then which scenario is most likely? In a perfect world, we'd already have the guardrails in place to allow AI to cooperate with humans before we even develop it.

Unfortunately, that presupposes that every one of the over 3,500 organisations developing AI were all on the same page. They're not – some are developing AI-weapons, while others are developing AI-nurses, with very different goals in mind. While "kill all humans" somehow feels unlikely, it may not take much to go from "cooperate" to "kill."

Case in point: in 2016, a friendly-looking robot named Sophia made by Hanson Robotics calmly told an audience at SXSW, "Ok, I will destroy humans." That was 5 years ago, and in that time, AI's processing power has increased by roughly 1,700%.

THE LIST

FEMALE NOBEL LAUREATES IN STEM

As of 2020, 57 women have won the Nobel Prize, of which 23 were in STEM. Marie Curie won it twice (physics in 1903 and chemistry in 1911) and her daughter, Irène Joliot-Curie, won the Nobel Prize in Chemistry in 1935, making the two the only mother-daughter pair of Nobel laureates. Here are some of the most recent STEM Nobel laureates in the last 2 decades.

JENNIFER DOUDNA (USA) & EMMANUELLE CHARPENTIER (France)

2020: Chemistry

For developing the precise genome-editing technology, CRISPR-Cas9 which has been allowing precise edits to the genome since its inception in the 2010s. Practical - and probably controversial - applications include altering human genes to eliminate diseases; creating hardier plants; wiping out pathogens, etc.

ANDREA M. GHEZ (USA)

2020: Physics

She's the fourth woman to win this award, which is for the discovery of a supermassive black hole at the centre of the Milky Way by developing techniques for studying the movement of stars. Black holes are no threat to Earth, and supermassive black holes play a part in star formation in galaxies.

FRANÇOISE BARRÉ-SINOUSSI (France)

2008: Physiology or Medicine

For the discovery of HIV, or the human immunodeficiency virus. The human body can't get rid of HIV, and once it's in the body, it starts to destroy white blood cells that help the body fight infection and disease. This discovery is crucial in radically improving treatment methods for AIDS sufferers.

DONNA STRICKLAND (Canada)

2018: Physics

For the method of generating ultrashort high-intensity laser pulses without destroying the amplifying material. She's the third woman to win this prize. Chirped pulse amplification has many uses, including corrective eye surgeries.

TU YOUYOU (China)

2015: Physiology or Medicine

For her novel therapy against Malaria - artemisinin - using Chinese medical texts from the Zhou, Qing, and Han Dynasties. The first mainland Chinese to win a Nobel Prize in science, she did so without a doctorate, medical degree, or training abroad.

MAY-BRITT MOSER (Norway)

2014: Physiology or Medicine

For the discovery of cells that constitute a positioning system in the brain, which is close to the hippocampus, an area located in the centre of the brain. The awareness of one's location and how to find the way to other places is crucial for both humans and animals.

ADA E. YONATH (Israel)

2009: Chemistry

For the successful mapping of the structure and function of ribosomes. Since the ribosome is a major bacterial target for antibiotics, her work has led to new antibiotics (she's since demonstrated how more than 20 antibiotics function) and a better understanding of antibiotic resistance.

CAROL W. GREIDER (USA) & ELIZABETH BLACKBURN (USA & Australia)

2009: Physiology or Medicine

For their discovery of how chromosomes are protected by telomeres, and the enzyme telomerase. Telomerase is key to the ageing process and the growth of cancer cells. Too much telomerase can increase the likelihood of cancer; too little can also increase cancer by depleting the body's healthy regenerative potential.resistance.

FRANCES ARNOLD (USA)

2018: Chemistry

For the directed evolution of enzymes (proteins that catalyse chemical reactions), which can result in more environmentally-friendly manufacturing of chemical substances, such as pharmaceuticals, and the production of renewable fuels.

LINDA B. BUCK (USA)

2004: Physiology or Medicine

Discovered that hundreds of genes in our DNA code for the odourant sensors are located in the olfactory sensory neurons in our noses. Humans use a family of more than 400 olfactory receptors (ORs) to detect odours.

CRAFTS
INFO
FINANCE
SHOPPING LIST

BY LINDSAY WONG

Streaming Celebrities

HOW DID SOCIAL MEDIA BECOME THE FUTURE OF ENTERTAINMENT?

In the last century, the most famous celebrities in the world were the people you saw in magazines or TV - people like actors, singers, and models. Fast forward to the current decade, and a new group of influential people have emerged from social media, on apps and streaming platforms we use regularly to keep up with our friends, the latest trends, and news. Social media influencers now have a huge reach among the general public as people spend more and more time on social media - some are even more well-known than popular actors and singers. The 21st century has demonstrated that social media is the future of entertainment.

THE RISE OF THE INFLUENCER

In the age of social media, influencers hold a lot of power. Even if an influencer is just a normal person with a normal life, they are able to persuade followers to be interested in their seemingly mundane life. Millions of followers across multiple social media platforms and channels prove that viewers are genuinely interested in their lives and what they do.

If an influencer releases their own book, song or TV show, chances are that their followers will consume it. These influencers have become sources of entertainment for their millions of followers who spend money on them and track their every move - much like how people idolise celebrities. As social media continues to evolve, more people will become influencers, creating yet another avenue where audiences will be entertained.

FIRST WAVE: YOUTUBE & INSTAGRAM

YouTube became popular around 2008 and channels with lots of subscribers, like Smosh and Shane Dawson, gained attention for having binge-worthy videos. In the next decade, even though the competition became fierce, more and more influencers in each country became trending topics on the platform.

YouTubers cover a range of topics, from beauty to gaming to reviews to music to lifestyle to languages. Videos cater to all kinds of audiences and people find comfort and solace from watching their favourite YouTubers. Realising their influence and potential, YouTubers started to host events for viewers to meet and greet their favourite personalities. This became another source of revenue for them, on top of getting paid from the amount of views they get from each video.

Instagram is another platform that hosts influencers with millions of followers. With nicely edited photos and/or interactive stories, influencers are able to retain the attention of their followers who are easily entertained for hours, simply by doom scrolling. A wide variety of celebrities have taken to the platform, including soccer superstar Cristiano Ronaldo who has over 330 million followers, actor The Rock with 266 million, and singer Ariana Grande with 263 million.

Functions on Instagram also allow influencer marketing to take place, where influencers advertise products via sponsored posts that bring in a steady stream of revenue for themselves.

SECOND WAVE: VINE & MUSICAL.LY

Short video platforms like Vine and Musical.ly were at its peak between 2013 to 2016. Influencers became popular on this app for being viral or for having consistently good content. Vine is notable for its timeless humour and memes, all contained within six seconds. The fact that six-second videos had to be memorable meant that every influencer had to be concise and entertaining.

Musical.ly was known for hosting videos of influencers, called musers, lip-syncing or dancing to their favourite songs. In 2017, Musical.ly was acquired by Bytedance, the owner of TikTok.

THIRD & CURRENT WAVE: TIKTOK & TWITCH

Every few years, a new social media platform emerges, where new viral content comes from. Currently, TikTok and Twitch are the top two platforms where influencers are thriving.

Similar to YouTube, all kinds of content is uploaded onto TikTok, but each video has a time limit of one minute. In September 2018, TikTok surpassed Facebook, Instagram, YouTube, and Snapchat in monthly installs in the App Store. Charli D'Amelio and Khabane Lame are Tiktok superstars, amassing over 100 million followers for their dancing and comedy skits respectively.

Twitch is a streaming platform mainly for people to watch their favourite gamers. Many popular Twitch stars are now influencers who have expanded their reach to other platforms. Twitch channels like Ninja and Pokimane are some of the most popular, with millions tuning in to watch them play games like Valorant and Fortnite.

ARIANA GRANDE
CRISTIANO RONALDO
SMOSH
POKIMANE
NINJA
CHARLI D'AMELIO
KHABANE LAME

BY ZHIQI WANG

THE STATE OF LEARNING

STEM EDUCATION IN SINGAPORE

Education plays a huge part in our lives in Singapore. Few of us can forget the long hours we have spent on our homework, assessment papers, and the notorious Ten-Year-Series (TYS). However, as technology evolves, our mode of education has to change as well and Singapore has made a series of changes that mark the inclusion of STEM (Science, Technology, Engineering, Maths) in our education landscape.

LEARN BY DOING

STEM education is taught through 'active learning', which asks students to identify problems and to work out a possible solution. Students learn a concept by making use of it, rather than by reading about it in a textbook. For older students accustomed to being told what they needed to know, it's a far cry from a textbook-centric, exam-evaluated model of education that Singapore is known for.

INTERDISCIPLINARITY

With the opening of the College of Humanities and Sciences at the National University of Singapore (NUS), STEM education has evolved significantly. The college sells itself on its unparalleled flexibility to pursue breadth and depth from more than 1,000 modules per academic year, as it combines the Faculty of Arts & Social Sciences and the Faculty of Science.

Gone are the days where one can focus just on one core subject – be Engineering or Accounting – and navigate their way to a stable career. Instead, this change means that students will need to combine knowledge from disparate fields of expertise – like coding and business – and synthesise new insights while identifying new opportunities.

This might come across as a surprise to many, especially due to the rather early streaming of Arts and Science classes way back in Junior College.

However, this new move could just be what the economy needs to navigate the challenges in the 21st century. Given the importance of innovation and technology-driven change in economies today, it is not surprising that STEM knowledge (and STEM education) is key to leading sustained economic growth.

DIGITISATION

The global digital landscape continues to evolve rapidly, accelerated by the COVID-19 pandemic, bringing to the fore increased demand for digital platforms, software, hardware, and services. Nowadays, we can shop online, get our favourite food online (and delivered to our doorsteps), and even explore the world online through virtual tours. This change in lifestyle means that many more opportunities will evolve in the virtual space, compared to the physical world.

Therefore, students will need to develop skills to capture these opportunities. With the rapid changes in the education system to cater to this technology boom, Junior College students can now take computing as an A-level subject. In addition, all upper primary pupils have been undertaking coding classes since 2020 as part of the Government's goal to develop a pipeline of tech talent for the digital economy.

LIFELONG LEARNING

The economy is shifting very quickly. The traditional economic engines of the 21st century, like Oil & Gas and Shipping, can no longer be the only pillars of our economy. To support this transition, the population needs to adopt a new mindset: one that embraces lifelong learning.

As technology's life cycle shortens, it is only inevitable that the knowledge we learn in school becomes obsolete. Therefore, we need to become lifelong learners, always curious about new technology and adopting them to keep up with the rest of the world.

In conclusion, tiny Singapore remains a nation that has one of the world's least natural resources, unlike some of our neighbouring countries. Therefore, education is our key comparative advantage and the system needs to equip our residents with the knowledge and attitude to thrive in this new century.

ASSISTIVE technology

by Copernicus Chua

Technology has changed our lives in so many ways. Anyone with access to it can read real-time news at the click of a button, make video calls, book reservations, and do a thousand other amazing, time-saving things every day. The able-bodied among us take access to it for granted. But what about those with a disability?

How does assistive technology help?

Assistive technology lowers the often invisible, but very real barriers that people with disabilities face every day, whether it's to do with reading, speaking, travelling, or even just writing an email. It allows them greater independence, in caring for themselves, working, or simply dealing with the world. It can allow them to participate and enjoy the benefits of the digital society.

with the same access to information and services as the rest of us take for granted.

Actually, assistive tech is nothing new. For instance, we've had electronic hearing aids for decades. What is new is harnessing the huge potential of tech like AI, robotics and voice-recognition to create bigger, better, more cost-effective assistive solutions.

EYEGAZE EDGE

LIVING more independently

While there's countless low-tech assistive living devices – from cut-proof gloves which allow individuals with neuro-muscular disease like MS or Parkinsons to safely chop food, to talking thermometers to assist vision-impaired people when cooking – some of the most innovative, and impactful are actually ultra-high tech.

In Singapore, we jokingly talk about the futility of using 'eye power' to accomplish tasks, but the joke's on us. Enter eye gaze-controlled assistive tech, which most of us have probably seen famously used by Dr.Stephen Hawking when he converts text into speech.

Products like the **Eyegaze Edge** works by tracking the user's eye movement with a camera, which controls a virtual

mouse, allowing users to do everything from turning appliances or lights on and off, dial phones, and type out written messages via a virtual keyboard.

While it can take considerably longer to type out complex sentences, experienced users can often type 2-3 medium-length words per minute. This seems slow, but eye gaze technology has actually become so advanced that researchers have discovered that different keyboard configurations (eg. QWERTY vs. alphabetical) have lower error rates, depending on the user's conditions, such as ALS or MS.

The technology is only likely to improve further, since the same tech is also being used commercially by marketing and social media companies to measure engagement and interest levels in users.

HONDA'S WALKING ASSIST

MOVEMENT & Travel

These range from hand-controls for cars which are common overseas (ie. the accelerator and brakes) – which are illegal in Singapore – to mobility scooters which we see all the time in Singapore to help older folks get around.

The most advanced version of that comes in the form of mecha-inspired walking assistance devices, like **Honda's Walking Assist** exoskeleton, which allows mobility-impaired people to walk with the help of supportive, robotic leg braces. They work by using movement sensors which detect small movements in the lower body, amplifying them through the robotic braces which help coordinate the pace, length of stride, and relative balance of the user. This makes it ideal for partially mobility-impaired individuals.

C-PEN READER

READING & Writing

Singapore's literacy rate (97.3%) is one of the highest in the world, so we take it for granted that everyone can read. But what if you're vision- impaired? Of course, there's old-fashioned braille which was invented in 1824, but technology has taken us way beyond that with a huge range of text-to-speech devices. One such device is a reading pen like the **C-Pen Reader** which dictates what they scan, as well as smartphone camera apps that capture written text and read it out loud, and of course, audio books.

Going the other direction, recent leaps in voice-recognition software – from **Watson Speech to Text** to **Amazon Transcribe** – have vastly improved speech-to-text applications for inexpensive devices like smartphones and tablets. By using AI to analyse individual sounds (within each spoken word), algorithms decide the most likely meaning, and transcribe that into text.

BY TARTAN OW

Lost Girls

THE PARADOX OF GENDER INEQUALITY & STEM

Ever since the Taliban took over, things have been objectively awful for the people of Afghanistan – especially its women. Ironically, some of the only good news out of Afghanistan is that its internationally- renowned, all-girl robotics team managed to escape the Taliban, and arrive safely in Mexico where they're being relocated.

Women may be vastly underrepresented in STEM education worldwide, but a curious anomaly happens when it comes to girls and women in developing nations, leading to a global gender-equality paradox for young women in STEM.

Gender equality and STEM

In a nutshell, multiple studies have found that the lower the gender-equality in a given country, the higher the percentage of women studying STEM. Or simply put in numbers, before the pandemic, women made up 70% of engineering students in Iran, 42% in Morocco, 41% in Algeria, and 40% in Jordan, but only 29% in Norway, 19% in the U.S., and just 18% in Australia. Those are just some countries, but the pattern repeats itself almost everywhere.

The Global Gender Gap Report (GGGR) by the World Economic Forum (WEF) calculates global gender inequality based on a matrix, including health and survival, educational attainment, labour force participation, percentage of seats in parliament, and more. According to the 2021 GGGR, Norway was third globally. Iran was 150th. Yet Iran has double the percentage of women studying STEM.

Even in the most gender-equal country in the world – Iceland – where a whopping 64% of all tertiary students are women

(according to European Union statistics), only 44% of STEM PhD students at the University of Iceland are female. In Denmark, which ranked second on the 2020 Gender Inequality Index (GII), only 33% of STEM graduates are female, according to a 2018 Agency for Science and Higher Education analysis.

Firstly, it should be said that every country's situation is different. For example, Iran indisputably has less gender equality than Australia or the US, but it also offers free university education to all students. So is it the cost that keeps young women out of STEM? Probably not, since Iceland also offers free education. Then is it societal attitudes? If you look at Iceland, the US, or Australia vs. Iran, that seems unlikely, too.

While these examples don't tell the whole story, they highlight a paradox. Why do countries with significantly less gender-equality, often have far higher percentages of women studying STEM?

The paradox

There's a few different arguments why there's a gender-equity paradox in STEM. Many people assume it's because the more liberal the country, the more choices women have. And given the choice, women somehow naturally prefer non-STEM subjects based on perceived gender bias. Objectively, people who assume that are wrong. And here's why:

Multiple studies in dozens of countries show that pre-teen girls outperform their male peers in standardised math and science tests. Psychologists and neuro-scientists may argue the specific reasons, but the result is undisputable. Preteen girls and boys also enjoy/prefer STEM subjects at roughly the same ratio.

So between the ages of 8-12, all things being equal, young girls are just as interested in, and more proficient at STEM than boys. So why don't we see more girls everywhere trending towards STEM? Herein lies the first paradox.

Multiple studies also show that even in countries with near gender-parity, from primary school onward there's unconscious bias directed at young girls steering them away from STEM. While that takes many different forms, deep down we all probably have a sense it's happening.

Nature vs Nurture

The unconscious bias may have different sources. For instance, it's often cultural – the idea that "girls should play with dolls, while boys should build things" is still inherent in many households today. It may be observational – since women in STEM are already underrepresented, we assume that STEM is more a "guy thing."

Sometimes, it can even be well- intentioned. For instance, parents may assume that STEM is difficult and they fear their daughters won't be as successful being in a male-dominated course – especially compared to sons who they ascribe different characteristics, like being more competitive.

Facing this litany of discouraging cultural and social messaging, it's no surprise that young girls in more developed countries – where there are viable, non-STEM study options – are often pushed away from STEM. This is then wrongly interpreted as them actively "choosing" non-STEM subjects.

To use a poor analogy: if you're in a sailboat and the wind pushes you in a different direction than you want to go, that's not an active choice. You can try to go against the wind, but that's much harder. You go in the direction you're blown, so it's wrong for someone to then say that you really chose that destination. The choice was increasingly taken out of your hands the moment the wind started blowing.

Interestingly however, researchers have found over the last 100 years, girls in dozens of countries have actually outperformed their male peers in all subjects (languages, math, social sciences, etc.).

In the Program for International Student Assessment, or PISA (a test that measures 15-year-olds' math, reading, and science abilities), girls from most countries are more likely to say they feel "helpless" at math, but their actual PISA math tests only showed a 2% lower score than boys. A 2018 paper published in Psychological Science found that girls performed about as well or better than boys did on science in 67 countries and regions.

In fact, extensive research shows the best overall predictor of a women's choice of field (at the degree level), is the amount of gender discrimination she perceives in that field.

So why do countries with lower gender equality have more women in STEM?

While not universally true, generally countries with lower gender-equality tend to also be economically poorer. There are many reasons for that (eg. geopolitics, colonialism, corruption, etc), but an undeniable factor is because a large chunk of the country's human capital – its women – are marginalised through lower literacy levels and lower job participation.

Zoomed out to a national level, this marginalisation leads to lower GDP, which in turn means a country has less resources to allocate for things like education.

Unsurprisingly, with the limited educational resources they do have, after essentials like basic literacy, poorer countries tend to emphasise STEM over non-STEM, because STEM generates more income for the individual and the nation.

Herein lies the second paradox. In countries with high levels of gender inequality and limited educational resources, only the better students tend to go on to higher levels of education. Research shows girls are better overall at school, and specifically better at

STEM, in late secondary school when poorer countries and poorer families are having to make tough choices about where to allocate limited resources to best serve their future interests.

Simply put, the cream then rises to the top, and practical economic decisions – like whose education to invest in – can start to trump gender-prejudice. Weirdly, this is something those countries have somehow gotten right, despite all the wrong reasons.

Or put another way, young girls have more than what it takes to compete academically in an equal, fair system. They can even succeed in an unequal system. They shouldn't have to, but that's another story altogether.

Ironically, in seemingly far more developed countries, the more we believe that we are getting close to achieving gender equality, the more we run the risk of convincing ourselves that any remaining gender disparities, such as the number of girls choosing STEM, are due to differences in abilities. They're not, but the minute we start believing they are, then they might as well be.

Cheat Sheet
By Tartan Ow

#73 What is STEAM?

Today, 93% of STEM workers earn above the national average for wages, and that's because we all generally agree, technology is the future. We've all heard of STEM, namely the combined fields of Science, Technology, Engineering, and Math. Building on that, STEAM is basically STEM with the addition of the Arts, including visual arts, drama, humanities, history, philosophy, etc.
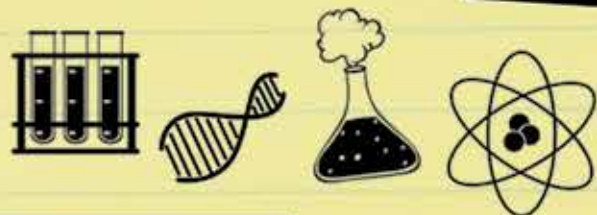
STEM VS. STEAM

STEM doesn't explicitly shun the Arts – it's just that until recently, mainstream STEM curriculum at universities deemphasised subjects that didn't have a direct relationship with technology.

While STEM explicitly focuses on scientific concepts, STEAM investigates the same concepts, but does this through inquiry and problem-based learning methods used in the creative process.

The aim of both STEAM and STEM is to solve complex technical problems. The main difference is how students approach scientific concepts. STEM focuses exclusively on solving issues through hard skills in math and science. STEAM studies the same hard skills, but also integrates knowledge in areas like design and creative writing.

STEM grads can be seen as pure technologists, while STEAM grads are more like Renaissance People. It's no surprise that people such as Leonardo Da Vinci have shown us the importance of combining science and art to make discoveries.

HOW DO THE ARTS HELP IN TECHNOLOGY?

STEM has worked well until now, because it focuses on solving technical problems in the most efficient, purely technical way possible. It took us to space, it created the internet, it unlocked the power of the atom. All things we take for granted now.

But as technology becomes more interactive (eg. trained AI, chat bots, simulations, VR, etc.), purely technical solutions aren't enough. Consumers increasingly want technology that feels seamless. For example, if two coders (one STEM, one STEAM) create similar VR simulations, the simulation that will succeed is not necessarily the mathematically complex one. It's the one we respond best to, because it's the most intuitive or user-friendly.

Possibly the best use case for STEAM can be seen in Apple products. While STEM is behind the technology of all its products, the company made them more human-centric with STEAM. The company attributes its success today to its emphasis on the user experience in its design.

In pop culture, characters like Shuri in Black Panther solves problems as a playful technologist, while Velma from Scooby Doo uses hard and soft skills to solve a wealth of problems.

The goal of good tech is to solve problems for human users. The goal of great tech is to do it in a way that makes it seamless, invisible, and even enjoyable. Studying the Arts, like drama or creative writing will never teach you how to write an algorithm. But it will train you to interpret and channel how technology is used, in a more human-centric way.

Asimo, a human-centric android

WHY STEAM?

Creating good technology always required creativity, but how to become creative never formally built that into its training under the STEM umbrella. By studying the arts as well as hard sciences, STEAM gives you both hard and soft problem-solving skills as it emphasises collaboration as the fastest way to understand highly-complex STEM concepts.

Teachers working in cross-curricular STEAM settings often see their students making connections between concepts and solving problems in new and exciting ways.

For example, engineers and programmers are increasingly co-developing software with Arts experts. A background in fields like design or visual arts helps create better tools, for instance, for data visualisation, like dashboards or infographics. These tools help consumers adapt to technology faster.

Future-ready employees need to have multiple areas of expertise or at least appreciate how a range of skills fit together.
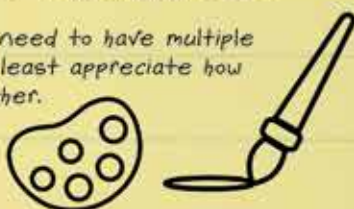
BY LINDSAY WONG

HALLYU X TECH

How Technology Helped the Hallyu Wave to Spread During Lockdown

The onset of lockdowns around the world pressed pause on many industries, including entertainment. When the COVID-19 pandemic started, many world tours and events were cancelled for K-pop artists and the production of Korean dramas slowed down. Despite this, the industry recovered quickly and adapted to the unusual new circumstances by shifting almost completely online. As a result, because of how accessible the internet is, the Hallyu wave continued to take over the world, primarily through digital means and avenues.

THE RISE OF ONLINE CONCERTS

When COVID-19 first became a major problem in Asia at the start of 2020, South Korea was one of the hardest hit countries. As a result, their music industry was severely affected and artists immediately returned to Korea. Even though music and music videos continued to be released regularly for each artist, they were no longer able to hold concerts and events to crowds because of the risk of spreading the coronavirus and newly implemented restrictions.

This posed a major setback for entertainment companies as one of their main revenue streams are concerts and world tours. Companies solved this problem by hosting virtual concerts, where one fan would pay a fee (around $50 USD) to access a streaming link. Fans could even submit videos of themselves or appear alongside their idols on the screen as their favourite artists. Because tickets were cheaper, more people around the world could access them and attend virtual concerts.

GETTING VIRTUALLY UP CLOSE AND PERSONAL WITH YOUR FAVOURITE IDOLS

During pre-COVID days, whenever an artist released a new album, they held fansigns around South Korea to sign albums and interact with fans. During the pandemic, entertainment companies started holding video call events for fans around the world, no longer limiting fansigns to just local fans.

Buying more albums grants a higher chance of winning the video call, so companies are able to make more profit by holding these events. Each online shop has different rules for their video call, but usually the fan is granted one minute with each member of the group, or a few minutes with the member of their choice. During that time, the fan can talk with the artist freely, in the comfort of their own home, through KakaoTalk, Line or Zoom. It is a great opportunity for any fan around the world to get up close and personal with their favourite idol.

K-POP'S EVERLASTING PRESENCE ON SOCIAL MEDIA

K-pop has always been present on social media platforms like YouTube, which helped the industry gain popularity outside of South Korea. During the pandemic, artists had more free time (since they no longer had concerts or world tours) and could explore different apps like TikTok, Instagram, Weverse, VLive, Bubble, and Lysn.

More content became available for fans to access. Some artists went viral on TikTok and raised awareness of their music, while others reached out to international artists for collaborations. K-pop artists fully used their digital advantage to seize opportunities and gain popularity with a wider audience.

K-DRAMAS ON STREAMING PLATFORMS

With many countries stuck in lockdown at various stages of the pandemic, people had more time to use streaming platforms, whether it was out of boredom or as a distraction from real life. People started venturing outside of their interests to watch other genres. Netflix has a sizable number of Korean dramas that cater to anyone's tastes, and they seem to add even more on a weekly basis to their platform.

Other streaming platforms focused on Asian entertainment, like Viu, iQyi and WeTV, also became more popular during the pandemic as they offered a bigger library of K-dramas. People fell in love with and kept up with their favourite K-dramas on these streaming platforms, thereby facilitating the growth of the Hallyu wave.

"WHAT IF WE TOLD YOU WE COULD BACK UP YOUR MIND?"

By Yin Loon

A FUTURE OF MIND UPLOAD

We're definitely no strangers to having a digital mirror version of ourselves, be they in apps, online games or on social media. But what if we can back up our minds and upload our "self" so that we can live on even after death?

Our minds, or "soul," can be defined as the data file and software of the brain, so hypothetically, you can transfer all the data into some server, in essence creating a stored version of "you" somewhere. This process is called "mind uploading."

The science of the brain and of consciousness increasingly suggests that mind uploading is possible – there are no laws of physics to prevent it – and the idea is bringing to life the feasibility and morality of "immortality."

WHAT IS MIND UPLOADING?

The human brain is made up of billions of individual neurons connected to other neurons; every time a neuron fires, electrochemical signals jump between them, creating information that enables the brain to process input and execute commands. Many neuroscientists believe that who we are – our personalities, emotions, even consciousness – lies in those patterns.

Mind uploading, or Whole Brain Emulation (WBE), hypothetically scans a physical structure of the brain to create an emulation of the mental state (including long-term memory and "self") and keeps it in digital form.

In the 1940s, neurophysiologist Warren McCulloch and mathematician Walter Pitts used math to describe brain activity, noting that a neuron can be in only one of two possible states: active or at rest. Early computer scientists realised that to programme a brainlike machine, they could use binary electric switches symbolised by 1 and 0 to represent the on/off state of individual neurons.

Based on this, our identity is nothing more than the behaviour of individual neurons and the patterns between them. So if technology can accurately record and analyse brain activity, our minds can theoretically be reduced to computations.

Among some futurists and within the transhumanist movement, it's believed that in a few decades, humans will be able to upload their minds to a computer, transcending the need for a biological body.

Back in 2013 Ray Kurzweil, director of engineering at Google and futurist, predicted that people will be able to "upload" their entire brains to computers and become "digitally immortal" by 2045.

Supporters say that many of the tools and ideas needed for mind uploading already exist or are currently under active development. While there's no real tangible evidence of mind uploading working yet, the idea of it is a central conceptual feature of numerous science fiction novels, films, and games.

SCI-FI VS REALITY

Theoretically, once the brain is digitised, the simulated mind could be stored in one of two ways: within a simulated world, or in the body of a robot, cyborg, or other humans. Whether consciousness is transferred into a machine or in a body, both worlds would be equally real. Maybe the better term is the "foundation" world and the "cloud" world.

A number of sci-fi works tackle both these scenarios, giving us insights into what a future of mind uploads may look like.

One of the first (if not the first) sci-fi to deal with mind uploading and human-machine synthesis can be found in Arthur C. Clarke's 1956 novel *The City and the Stars*. Set one billion years in the future, the minds of inhabitants are stored as patterns of information in a Central Computer in between a series of 1,000-year lives spent in cloned bodies.

THE CLOUD WORLD

Can humans live in a perpetual simulated environment? In the San Junipero episode of *Black Mirror* (2016), we see how a mind is uploaded into a simulated world as a way of life extension in paradise, where the mind is no longer connected to a living body.

This scenario is perhaps the most alluring version of mind upload, where the deceased can live on digitally. Imagine Grandma enjoying her time in a simulated playground, idealised as a sort of human-made heaven. Occasionally, she can even join in on irl family dinners – as her sim – via a video conference on the big screen.

If humans do get to live in digital form after death, imagine the sheer number of data there'll be – where would you find enough server farms to store them? A chilling probability lies in *The Matrix* (1999) where the humans live in a simulated world while their physical bodies are used as "batteries" for the machines that run them.

However, mind uploading provides humankind with a permanent backup to our "mind-file" as a means for human culture to survive a global disaster by making a functional copy of human society in digital form.

In *The 100* (2014-2020), the idea of humans living as consciousness has been brought forthtwice in the series – first through a simulated society called City of Light which is accessible after a silicon Chip is swallowed, and the second is through a concept called Transcendence in which humans exist as energy beyond their mortal forms. In both cases, humans are spared from the pain of living physically, allowing for mankind to be preserved eternally in a universe that's continually hostile to the human body.

For those already thinking about when living in a simulated world will be feasible – it isn't something that's attainable only in the far future. The technology in *Ready Player One* (2018) is already within grasp. While not quite a full mind upload, it offers a glimpse into a tantalising future.

THE FOUNDATION WORLD

The most popular reason for mind upload is the ability to insert the digital consciousness into another body – be they human, robot, or a cyborg. So, rather than living in a virtual world without a physical body, humans of the future can actually look and feel alive.

In *Altered Carbon*, human consciousness is contained in a "stack" – a storage device the size of a palm – that can be perpetually transferred between sleeves (bodies). The sleeves are either naturally born, genetically/cybernetically modified, or artificially created to grant enhanced abilities.

Upon the death of a sleeve, only the rich can choose a high-grade or custom-made body, while the poor only have access to whatever's available, which is usually of inferior health or old age. This brings to mind issues of social class. In effect, the poor only get to live in inferior bodies, and get re-sleeved once before their mind goes into storage. In this future, only the rich get to live forever.

This idea is perpetuated in films like *Selfless* (2015), where the wealthy are able to "shed" into new bodies that turn out to be people whose memories are overwritten, while in *The 6th Day* (2000), a billionaire manages to illegally make a clone of himself in order to keep his wealth.

Transferring consciousness into another body isn't so different from mechanising the body – both have the goal of prolonging (and improving) life. *Ghost in the Shell* (1989-) portrays a future in which humans can replace body parts with machines, which in essence, makes them less human.

ARE THESE IDEAS THE FUTURE?

In theory, if the information and processes of the mind can be disassociated from the biological body, they are no longer tied to the individual limits and lifespan of that body. This could be a good thing for many reasons – we could be causing less pollution to the earth, and diseases won't exist.

In addition, the brains of some of the smartest people can be preserved into the future – for example, they could be on interstellar space explorations as either a robot or software, avoiding the perils of zero gravity, the vacuum of space, and cosmic radiation. Better yet, if we can store human consciousness as data, we can theoretically transfer them to a world that's light years away in seconds. In *Altered Carbon*, humans are teleported instantly into an awaiting sleeve on another planet in a process called Needlecasting.

A future where humans are parked in a computer system or in an engineered sleeve does sound enticing, because if it's anything that future dystopia teaches us, it's that the world will only get increasingly poisonous and dangerous for humans to live in, causing widespread infertility in the process. The way to preserve mankind may be to actually prolong "life" in another format.

However, as with all things, the debate on this type of technology is always about who gets to have the privilege of using it. Will we still be shackled by our social status even after death? Many dystopian sci-fi have discussed the possibilities of only the rich being capable of becoming immortal, who probably won't be interested in descendents to carry on a legacy if they can prolong their own lives.

Perhaps one of the biggest issues of mind transfer is that it's essentially a software, which means brain emulations can be erased by computer viruses or malware. Assassinations may come in the form of a cyberattack. Or, like Sgt Motoko in *Ghost in the Shell*, the brain could be hacked to do the bidding of an attacker. If getting bank accounts hacked is commonplace in today's world, imagine the level of damage the hacking of human lives would be in the future.

However, despite the many warnings and possible outcomes of mind uploading in the future, many transhumanists look forward to the development and deployment of mind uploading technology.

BY NINA GAN

AGE OF
PERVERSION

TECH REVOLUTION AFFECTING SOCIAL LIVES

These days, you have plenty of tech that perform a huge range of tasks to make our lives more convenient, from food delivery apps to AI assistants. However, while technology is created to better our lives, it doesn't take long before people start using them for all the wrong reasons, and in the process, change our social bonds and psychological states.

THE INTERNET IS FOR EROTICA

From Google to news websites, the internet has provided us with a fountain of knowledge and entertainment. A 2021 study published in Frontiers in Psychology suggests an unprecedented increase in internet use during the pandemic has led to a rapid uptake of dysfunctional behaviours related to internet addiction including online pornography, internet gaming, online gambling, and excessive use of social media.

A 2006 study on internet addiction concluded that of the many internet-related activities, "erotica" had the greatest potential to be addictive. Watching porn can become just as addictive as using substances, and their processes and impacts are very similar.

As of April 2021, according to Similarweb, 2 porn sites are among the top 10 most visited sites worldwide. According to the SEMrush Traffic Analytics tool, as of May 2021 porn sites received more website traffic in the US than Twitter, Instagram, Netflix, Pinterest, and LinkedIn combined.

Porn addiction's negative effect on one's sex life is mostly due to the inability to achieve the same response in real life. This leads to a change in romantic behaviour,

including increased aggression, dominance, and emotional disconnection. It may also influence a more permissive attitude towards casual sex, and skew our standards of beauty.

Widespread access to the internet has also made it easier for "revenge porn" to be uploaded. Research by UK-based Refuge has found that one in 7 young women has received such threats, causing victims to be exposed to workplace discrimination, cyber-stalking or physical attack.

MOBILE PHONE BUBBLE

These days, it seems like we can't live without our mobile phones and we know what a dinner date looks like these days. We see mobile phone zombies eating silently, rather than socialising with someone else across the table. You don't need a psychologist to tell you that it doesn't exactly forge bonds with the person you're eating with.

But mobile phone addiction isn't just ruining dating life. Simply Google 'peeping tom' or 'upskirt' and you'll find lots of cases in Singapore involving men taking illicit photos of women. Culprits have admitted to being addicted to "homemade porn," and because it's so easy with a mobile phone, the problem's only getting worse.

While some use these illicitly-recorded materials for private use, some have taken to illegally sharing them on apps like Telegram. There have been two high-profile cases in Singapore involving illegal Telegram groups that disseminate materials like these. Obviously, this sort of addiction is becoming a serious issue because it's increasingly widespread. One can easily imagine the stress and fear (of privacy invasion) it's caused to all the victims.

ARTIFICIAL INTELLIGENCE HURDLES

Sophia, the humanoid robot, will be mass produced this year. Introduced in 2016, she showed us the capabilities of an artificial intelligence (AI) robot designed for general reasoning and conversation, adept at imitating human facial expressions.

Unsurprisingly, the technology is also used in the newest iterations of "sex robots" that respond to touch and have unique "personalities." Men with sex robots reportedly have actual relationships with them, which raises all sorts of questions as to their relationships with real women.

AI has also been used on deepfakes. You've probably seen late actor Paul Walker resurrected for Fast & Furious 7, but the current iterations of deepfake programmes are now being used to digitally "strip" unsuspecting, ordinary women. This brings to the fore new legal issues concerning privacy and "sextortion," adding to the stress women have to deal with, as the law has yet to catch up to the technology.

TECH THE MESSENGER

From self-inflicted addiction to its widespread repercussions on unsuspecting victims, it's clear that while tech is supposed to better our lives, it can cause unexpected harm to our psyche and even our social bonds when we give in to our perverted selves.


STRESS RELIEF

With the pandemic still far from over, many of us are unsurprisingly super stressed. With all the data out there, we know the symptoms of Covid-19 and which parts of our body it affects. But how much do you know about your other inner organs? For a bit of a test, try and see if you know – or remember – about human anatomy.

DIRECTIONS

Cut out all the organs and arrange them on a blank outline of a human body

HUMAN ANATOMY
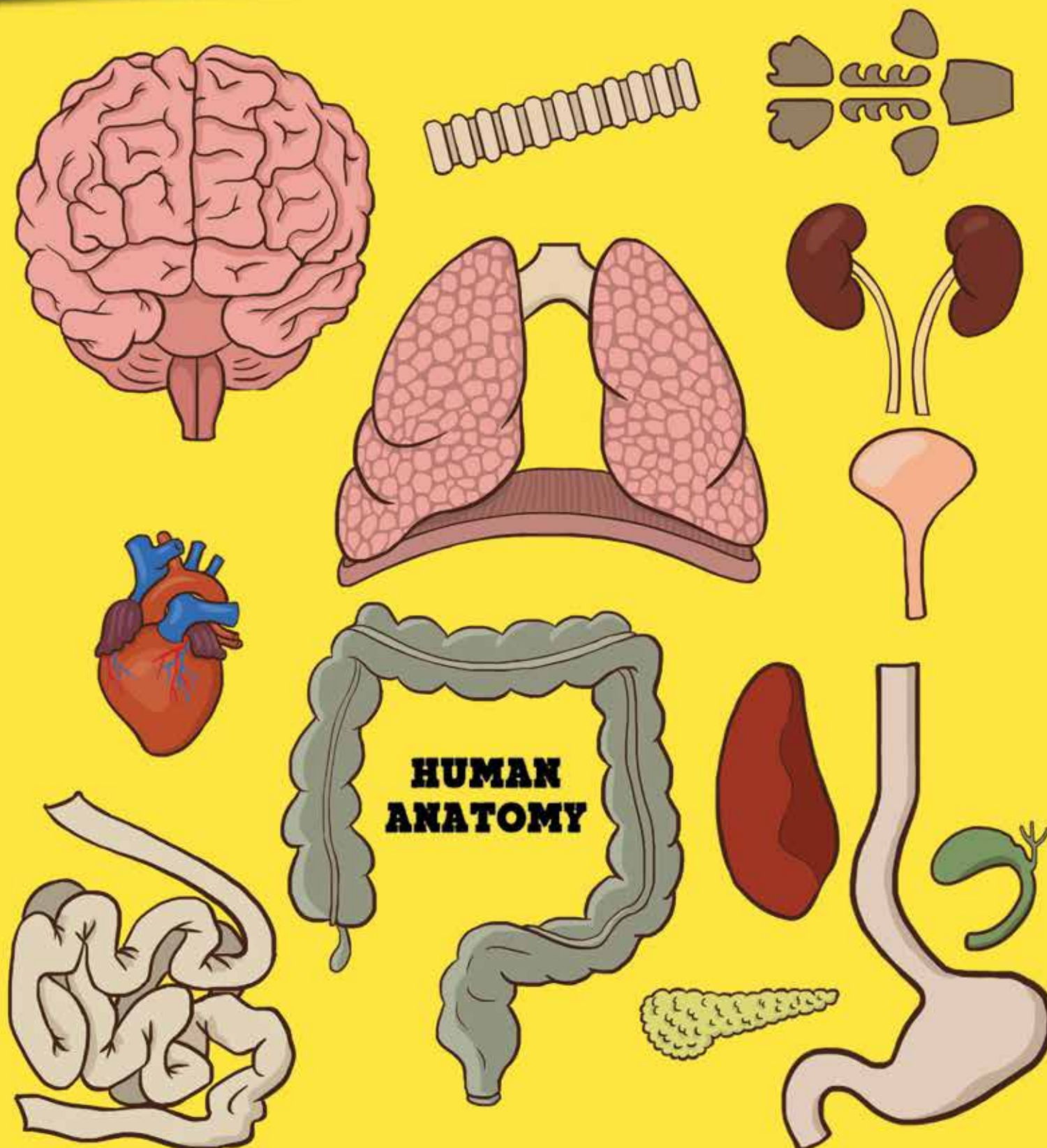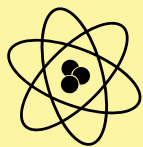
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